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ABSTRACT

The manual contains career guidance materials describing occupations and career development opportunities in the Navy. The materials were developed for integration into the Oregon Career Information System, a career education program utilizing both computerized and manual information systems. The report includes a discussion of the general work of the Navy, its size and organization, work environment, hiring practices, pay, training and education, and a comparison of Navy occupations with those listed in the Oregon Career Information System. The bulk of the document contains descriptions of each enlisted occupation or "rating" and each officer category and specialty. The following detailed information is provided for 70 Navy enlisted occupations: nature of the job, working conditions, qualifications, training provided by the Navy, Navy employment opportunity, and additional information sources (page number references within the document). The same categories of information, except for Navy training, are presented for 60 officer occupations. (Author/MS)

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Accurate career information is the cornerstone on which knowledgeable career choices are made. The success of the All-Volunteer Navy is closely linked to the validity of perceptions about the Navy among the civilian population.

This report contains, in manual form, career guidance materials describing occupations and career development opportunities in the Navy. The

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a) A discussion of the general work of the Navy which includes a description of the special environment within which Navy occupational tasks are performed; a comparison of Navy occupations with the occupations listed in the Oregon Career Information System; and general information on Navy career development

b) A description of each enlisted occupation or "rating"

c) A description of each officer category and specialty.

These materials are undergoing test and evaluation in Oregon in a pilot program designed to illuminate the advantages of including accurate Navy career information in an existing state career education program.

**OPERATIONS RESEARCH, Inc.**
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**SILVER SPRING, MARYLAND**
20910

# WORK IN THE NAVY -- A DESCRIPTION OF NAVY OFFICER AND ENLISTED OCCUPATIONS

6 June 1975

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# SUMMARY

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# I. THE NAVY AS AN EMPLOYER

## INTRODUCTION

The Navy needs new employees every year. These new sailors contribute their own abilities to the Navy's work. At the same time, they develop their abilities, not only by working, but by participating in Navy training and education programs. Over the years, sailors learn to assume greater responsibility, either in the Navy or within other organizations.

This process, which is called "career development", does not take place automatically. Sailors need to realize how much their pre-Navy experiences can help the Navy. The Navy needs to recognize each individual's value to Navy work. The individual sailor has to appreciate how much he or she is learning by working, training and studying in the Navy, and how these experiences can affect advancement in the Navy or within civilian employment.

The information provided in this manual is intended to help the users of the Career Information System to understand the Navy in career development terms. The Navy, like all other employers, does not provide suitable career development experience for every man and woman. For many people, however, the Navy is an organization in which individuals can find personal satisfaction and career growth as well as earnings and fringe benefits.

The United States Navy is a large, modern, public service employer. In many respects it is very similar to other public service organizations. But the Navy is also an employer that has unique features because the Navy is a military organization that operates on the sea, under the sea and in the air to carry out a mission of providing for sea-based national defense; of providing military aid and support for U.S. forces and for those of allies; and of protecting the rights of ships to move about freely on the oceans of the world.

## The Navy Is a National Public Employer

The Navy is established by the Congress of the United States, is subject to the supervision and control of the President of the United States, and is ultimately responsible to every citizen. The Navy does not fight except when ordered to do so by the President. The Navy must operate at all times within the limits of the laws and regulations that govern its activities. Many Navy people are employed in making sure that these laws and regulations are followed and that the Navy's funds, which come from the taxpayer, are carefully and effectively invested in achieving the Navy's mission. In this respect, the Navy is like the other agencies of the national government.

Navy people wear uniforms to identify themselves as members of the Navy to each other and to other people. Other military personnel, police officers, firemen and even football players wear uniforms for similar reasons. The Navy uniform and those of the other armed services are also required by international law. The uniform is mandatory in international law so that military personnel can be distinguished from civilians in areas where fighting is taking place. This provides some protection to civilians.

## The Navy Is a Traditional Employer

Despite the fact that the Navy is very modern, many aspects of Navy life are traditional. Many of the old traditions of the Navy are maintained because they have produced effective performance in the past, perhaps over several hundred years, in the United States Navy and in the navies of other nations. Other traditions, especially those that involve ceremonies, are retained to remind sailors that in the past other men and women have faced the challenges of Navy life successfully.

The Navy speaks its own version of the English language, filled with nautical terms, even when operating ashore. A ceiling is called an "overhead," for example; a floor is always a "deck;" a wall is a "bulkhead;" a toilet is a "head." The use of this traditional language helps sailors wherever they are to affirm their identity as sailors, and to rehearse, in a way, for the time when they may go to sea again.

## The Navy Is an Equal Opportunity Employer

The Navy is actively working to eliminate all forms of discrimination against women and members of minority groups. In no case is a sailor deprived of an opportunity for training, advancement or assignment due to race, religion or national origin. The Navy has also instituted training programs, seminars and discussions that are designed to reduce prejudices that have grown out of the past. Navy policies and actions emphasize that equal opportunity is the right of all Navy personnel.

Women are hired to work in almost all ratings but do not serve aboard combatant ships. Because the combat mission of the armed forces has been traditionally perceived as the duty of the male members of United States society, the Congress has passed laws that prohibit the Navy from assigning women to combat or combatant ships. As a result, the Navy does not assign women to occupations that are employed almost entirely on combatant ships, i.e., those which have very few shore positions. These occupations are Aviation Anti-Submarine Warfare Operator, Electronics Warfare Technician, Fire Control Technician, Gunner's Mate, Instrumentman, Molder, Opticalman, Patternmaker, Sonar Technician, and all Nuclear Field specialties. All other occupations are open to qualified women.

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## SIZE AND ORGANIZATION OF THE NAVY

### The Size of the Navy

The Navy is a very large organization employing over 500,000 uniformed personnel and over 300,000 civilians full-time. In addition, the United States Naval Reserve, a part of the Navy, employs about 100,000 uniformed personnel on a part-time training basis.

### The Organization of the Navy

Like many other modern organizations of its size, the Navy is hierarchical. This means that the authority for making decisions starts with one person, and he in turn delegates that authority to personnel at lower levels in the organization. Within this type of organization, each person knows who is his supervisor and knows who is above and below him in the organization.

The senior official in the Department of the Navy is the Secretary of the Navy. He is a civilian appointed by the President with the approval of the Senate. He directs and controls the Navy by establishing broad policies and regulations, by his appointment of officers and officials, and by his decisions in cases and matters brought to his attention. The senior military officer of the Department of the Navy is the Chief of Naval Operations. He is a four-star admiral and is responsible to the Secretary of the Navy for the command, the use of resources and for the efficient operation of the Navy fleets and shore bases. The Chief of Naval Operations delegates authority to fleet and shore-based commanders, who in turn delegate authority to individual ship and base commanders. On each ship, the captain is in complete command, but the captain delegates authority to other officers and sailors who can make decisions concerning how to run their assigned parts of the ship.

### The Sailor's Rank and Occupation

Because of the size and organization of the Navy, each person has two titles. The first title represents a person's level of authority and responsibility in the organization. For enlisted personnel in the Navy, this level is called a "rate". For an officer, this level is called a "rank". These titles (or rates and ranks) are shown in the following illustration.

## Enlisted Rates

Seaman Recruit
Seaman Apprentice
Seaman
Petty Officer, Third Class
Petty Officer, Second Class
Petty Officer, First Class
Chief Petty Officer
Senior Chief Petty Officer
Master Chief Petty Officer

## Officer Ranks

Warrant Officer
Chief Warrant Officer
Ensign
Lieutenant Junior Grade
Lieutenant
Lieutenant Commander
Commander
Captain
Rear Admiral (lower half)
Rear Admiral (upper half)
Vice Admiral
Admiral

The second title reflects a sailor's occupation, the kind of work he or she does, and the skills he or she employs while doing it. For enlisted personnel, these occupations are called "ratings". Note that some of the titles are very unusual and that some of them reflect the traditions of the sea. In the table below, Navy "ratings" are listed according to the CIS Codes and Occupational titles with which much of the work of the "ratings" is similar.

## TABLE 1

## SIMILAR OCCUPATIONAL TITLES AND NAVY RATINGS

| CIS Code | Occupational Title | Navy "Rating" |
|---|---|---|
| 1411 | Office Managers | Yeoman<br>Personnelman<br>Storekeeper<br>Disbursing Clerk<br>Aviation Storekeeper<br>Aviation Maintenance Administrationman |
| 1412 | Secretaries | Yeoman<br>Legalman<br>Personnelman |
| 1414 | Stenographers | Yeoman<br>Legalman |
| 1416 | Clerk Typists | Yeoman<br>Legalman<br>Personnelman |
| 1418 | General Office Clerks | Yeoman<br>Communications Technician - Administration<br>Personnelman<br>Legalman |
| 1452 | Receptionists | Yeoman<br>Personnelman |
| 1454 | Telephone and Telegraph Operators | Radioman<br>Communications Technician |
| 1614 | Accountants and Auditors | Disbursing Clerk<br>Ship's Serviceman |
| 1616 | Bookkeepers | Disbursing Clerk<br>Aviation Maintenance Administrationman<br>Ship's Serviceman<br>Storekeeper<br>Aviation Storekeeper |
| 1642 | Cashiers and Bank Tellers | Disbursing Clerk<br>Ship's Serviceman |

TABLE 1 (Cont)

| CIS Code | Occupational Title | Navy "Rating" |
|---|---|---|
| 1684 | Programmers and Systems Analysts | Data Processing Technician<br>Data Systems Technician |
| 1686 | Computer Operators | Data Systems Technician<br>Data Processing Technician |
| 1688 | Key Punch Operators | Data Processing Technician |
| 1692 | Office Machine Operators | Data Processing Technician |
| 2174 | Freelance Writers | Journalist |
| 2176 | Reporters and Editors | Journalist |
| 2356 | Engineering Technicians | Engineering Aid |
| 2364 | Draftsmen | Illustrator-Draftsman |
| 2654 | Medical Technologists | Hospital Cropsmen |
| 2656 | Laboratory Tester | Hull Maintenance Technician |
| 3112 | Automobile Mechanics | Aviation Support Equipment Technician<br>Construction Mechanic<br>Engineman |
| 3114 | Truck and Heavy Equipment Mechanics | Construction Mechanic |
| 3116 | Aircraft Mechanics | Aviation Electrician's Mate<br>Aviation Structural Mechanic<br>Aviation Machinist's Mate |
| 3118 | Small Engine Repairman | Machinist's Mate<br>Engineman |
| 3124 | Service Station Attendants | Aviation Boatswain's Mate<br>Boatswain's Mate |
| 3144 | Industrial Machinery Repairman | Machinery Repairman |
| 3146 | Heat and Cooling Systems Mechanics | Aviation Structural Mechanic<br>Boiler Technician<br>Engineman<br>Machinist's Mate<br>Utilitiesman |

TABLE 1 (Cont)

| CIS Code | Occupational Title | Navy "Rating" |
|---|---|---|
| 3164 | Office Machine Repairman | Instrumentman<br>Radioman<br>Communications Technician - Maintenance |
| 3166 | Telephone Installers-Repairman | Construction Electrician<br>Interior Communicaions Electrician |
| 3168 | Radio and TV Repairmen | Aviation Antisubmarine Warfare Technician<br>Aviation Electronics Technician<br>Aviation Fire Control Technician<br>Communications Technician<br>Electronics Technician<br>Interior Communitions Electrician |
| 3184 | Jewelers | Instrumentman<br>Opticalman |
| 3186 | Instrument Repairman | Instrumentman<br>Opticalman |
| 3422 | Building Maintenance Men | Hull Maintenance Technician |
| 4222 | Powdermen | Gunner's Mate<br>Torpedoman's Mate<br>Mineman<br>Aviation Ordnanceman |
| 4242 | Painters | Aviation Structural Mechanic<br>Boatswain's Mate<br>Builder |
| 4244 | Plasterers | Builder |
| 4246 | Cement and Concrete Finishers | Builder |
| 4254 | Carpenters | Builder |
| 4264 | Bricklayers | Builder |
| 4274 | Plumbers | Hull Maintenance Technician<br>Utilitiesman<br>Boiler Technician |
| 4276 | Floor Layers | Builder |
| 4278 | Roofer | Builder |

TABLE 1 (Cont)

| CIS Code | Occupational Title | Navy "Rating" |
|---|---|---|
| 4324 | Bakers | Mess Management Specialist |
| 4326 | Meat Cutters | Mess Management Specialist |
| 4446 | Seamstresses and Tailors | Ship's Serviceman<br>Aircrew Survival Equipmentman |
| 4448 | Sewing Machine Operations | Ship's Serviceman<br>Aircrew Survival Equipmentman |
| 4464 | Laundry and Dry Cleaning Workers | Ship's Serviceman |
| 4496 | Shoe Repairman | Ship's Serviceman |
| 4734 | Photographers | Photographer's Mate<br>Photographic Intelligenceman |
| 4766 | Printing Occupations | Lithographer |
| 5422 | Metalworking Patternworkers | Patternmaker |
| 5424 | Molders | Molder |
| 5426 | Foundry Worker | Molder<br>Steelworker |
| 5464 | Machinists | Machinery Repairman<br>Patternmaker |
| 5482 | Welders | Boilermaker<br>Aviation Structural Mechanic<br>Hull Maintenance Technician<br>Steelworker<br>Utilitiesman |
| 5484 | Sheet Metal Workers | Aviation Structural Mechanic<br>Steelworker<br>Hull Maintenance Technician |
| 5486 | Body and Fender Repairman | Aviation Support Equipment Technician<br>Hull Maintenance Technician<br>Aviation Structural Mechanic |
| 5488 | Blacksmith and Forge Shop Workers | Hull Maintenance Technician<br>Machinery Repairman<br>Molder<br>Steelworker |

TABLE 1 (Cont)

| CIS Code | Occupational Title | Navy "Rating" |
|---|---|---|
| 5624 | Lineman | Construction Electrician<br>Electrician's Mate<br>Interior Communications Electrician |
| 5626 | Electricians and Electrical Repairman | Aviation Electrician's Mate<br>Aviation Electronics Technician<br>Electronic Warfare Technician<br>Electrician's Mate<br>Aviation Fire Control Technician<br>Communications Technician<br>Electronics Technician<br>Fire Control Technician<br>Interior Communications Electrician<br>Mineman<br>Missile Technician<br>Ocean Systems Technician<br>Sonar Technician<br>Torpedoman's Mate<br>Gunner's Mate |
| 5664 | Broadcast Technicians | Radioman<br>Interior Communications Electrician |
| 5686 | Electronics Assemblers | Ocean Systems Technician |
| 5924 | Rubber and Plastics Fabricators | Patternmaker |
| 5944 | Powerhouse Fireman | Boiler Technician |
| 5946 | Sewage Plant Operators | Utilitiesman |
| 6126 | Air Traffic Controllers | Air Controlman<br>Operations Specialists |
| 6152 | Bulldozer Operators | Equipment Operator |
| 6156 | Yarding and Loading Occupations | Boatswain's Mate |
| 7114 | Warehousemen | Storekeeper<br>Aviation Storekeeper |
| 7116 | Shipping and Receiving | Storekeeper<br>Aviation Storekeeper |

TABLE 1 (Cont)

| CIS Code | Occupational Title | Navy "Rating" |
|---|---|---|
| 7118 | Stock Clerks | Storekeeper<br>Aviation Storekeeper<br>Ship's Serviceman |
| 7122 | Mail Carriers | Postal Clerks |
| 7824 | Chefs and Dinner Cooks | Mess Management Specialist |
| 7826 | Fry Cooks | Mess Management Specialist |
| 7856 | Stewards and Stewardesses | Mess Management Specialist |
| 7884 | Kitchen Helpers | Mess Management Specialist |
| 8117 | Physician's Assistants | Hospital Corpsman |
| 8124 | Pharmacist | Hospital Corpsman |
| 8164 | Licensed Practical Nurses | Hospital Corpsman |
| 8166 | Nurses Aides and Orderlies | Hospital Corpsman |
| 8174 | Dental Hygienists | Dental Technician |
| 8176 | Dental Assistants | Dental Technician |
| 8184 | Barbers | Ship's Serviceman |
| 8414 | Counselors | Navy Counselor<br>Personnelman |
| 8428 | Social Service Aides | Navy Counselor<br>Personnelman |
| 8458 | Education Program Specialists | Navy Counselor |
| 9414 | Law Enforcement Officers | Master-at-Arms |
| 9426 | Fireman | Boatswain's Mate<br>Aviation Boatswain's Mate<br>Hull Maintenance Technician |
| 9824 | Radio and Television Announcers | Journalist |
| 9866 | Performing Arts | Musician |

An officer's occupational title is determined by the officer "category" to which he or she belongs and by any "specialties" in which he or she may be qualified. There are five categories of officers, each of which is described below.

| | |
|---|---|
| Unrestricted Line Officers | These officers are eligible to command ships, squadrons, naval bases, naval air stations, and other facilities. |
| Restricted Line Officers | These officers were Unrestricted Line Officers at one time but have become highly specialized in one area and are no longer eligible for most commands. |
| Staff Corps Officers | These officers provide medical, dental, logistic, engineering, legal, and clergical support on Navy ships and shore stations. |
| Limited Duty Officers | These officers were enlisted personnel at one time and now perform as managers in the technical fields they learned as enlisted personnel. A few of these officers are eligible for command of certain ships. |
| Warrant Officers | These officers were enlisted personnel at one time and now perform as technical specialists in the occupations they learned as enlisted personnel. |

Officers in each category become specialized in various fields. In the case of Unrestricted Line Officers, in addition to those performing general leadership, management and administrative duties, there are officers performing in four warfare specialties—Air Warfare, Surface Warfare, Submarine Warfare, Special Warfare. The warfare specialties indicate special skills, but these officers also perform many general leadership, management and administrative duties. It is significant to note that women are participating in naval aviation as pilots and flight crew members in non-combatant aircraft. The various specialties for each officer category are listed in the table that follows.

## TABLE 2

## OFFICER CATEGORIES AND SPECIALTIES

| Officer Category | Specialty |
|---|---|
| Unrestricted Line Officers (URL) | General |
| | Air Warfare |
| | Surface Warfare |
| | Submarine Warfare |
| | Special Warfare |
| Restricted Line Officers (RL) | Engineering Duty |
| | Aeronautical Engineering Duty |
| | Cryptology |
| | Naval Intelligence |
| | Public Affairs |
| | Geophysics |
| Staff Corps Officers | Medical |
| | Dental |
| | Medical Service |
| | Nurse |
| | Supply |
| | Chaplain |
| | Judge Advocate General (Legal) |
| | Civil Engineer |
| Limited Duty Officers (LDO) | Supply |
| | Civil Engineer |
| | Deck Occupations (like Boatswain's Mate, Quartermaster, Signalman) |
| | Operations |
| | Ordnance |
| | Explosive Ordnance Disposal |
| | Administration |
| | Data Processing |
| | Bandmaster |
| | Engineering/Repair |
| | Electronics |
| | Cryptology |
| | Aviation Operations |
| | Intelligence |
| | Photography |
| | Meteorology |
| | Aviation Ordnance |
| | Aviation Deck |
| | Nuclear Power |

TABLE 2 (Cont)

| Officer Category | Specialty |
|---|---|
| Limited Duty Officers (LDO) (Cont) | Avionics |
| | Aviation Maintenance |
| | Mess Management |
| Warrant Officers (WO) | Supply Clerk |
| | Civil Engineer |
| | Boatswain |
| | Operations Technician |
| | Ordnance Technician |
| | Underwater Ordnance Technician |
| | Explosive Ordnance Disposal Technician |
| | Ship's Clerk |
| | Data Processing Technician |
| | Bandmaster |
| | Engineering Technician |
| | Repair Technician |
| | Nuclear Power Technician |
| | Electronics Technician |
| | Communications Technician |
| | Aviation Boatswain |
| | Aviation Operations Technician |
| | Intelligence Technician |
| | Photographer |
| | Aerographer |
| | Aviation Ordnance Technician |
| | Avionics Technician |
| | Aviation Maintenance Technician |
| | Physician's Assistant |
| | Food Service |

In Table 3 below, Navy Officer specialties are listed according to the CIS Codes and Occupational Titles to which the specialties are generally similar. In the case of Unrestricted Line Officers, their professional skills are of a very general nature so the general category is listed rather than a specialty. Also, in some cases, comparing an officer specialty with a single CIS Code and Occupational Title does not give a clear picture of all the occupational skills required of officers during their Navy service. For example, Supply Corps Officers compare in general with Business Executives (CIS Code 1144). However, at different times during their Navy service, they may perform such occupations as Accountants and Auditors (CIS Code 1614), Programmers and Systems Analysts (CIS Code 1684), Bookkeepers (CIS Code 1616), and others. To indicate that officers may perform in such varied occupations, some CIS Codes and Occupational Titles will be compared with "sub-specialties" of officer specialties.

## TABLE 3

## OCCUPATIONAL TITLES AND SIMILAR NAVY OFFICER SPECIALTIES

| CIS Code | Occupational Title | Navy Officer Specialty |
|---|---|---|
| 1132 | Hotel and Motel Manager | Supply Corps Sub-specialty |
| 1134 | Hospital Administrator | Medical Service Corps<br>Warrant Officer (Physician's Assistant) |
| 1136 | Education Administrator | Unrestricted Line Officer Sub-specialty |
| 1138 | Public Administrator | Unrestricted Line Officer<br>Limited Duty Officer (Administration) |
| 1142 | Small Business Operator | Supply Corps Sub-specialty |
| 1144 | Business Executive | Unrestricted Line Officer<br>Supply Corps Officer |
| 1152 | Construction Superintendent | Civil Engineer Corps<br>Limited Duty Officer (Civil Engineer)<br>Warrant Officer (Civil Engineer) |
| 1154 | Production Superintendent | Engineering Duty Officer<br>Aeronautical Engineering Duty Officer<br>Limited Duty Officer Sub-specialty<br>Warrant Officer Sub-specialty |
| 1162 | Sales and Service Manager | Unrestricted Line Officer Sub-specialty<br>Supply Corps Sub-specialty<br>Engineering Duty Officer Sub-specialty<br>Aeronautical Engineering Duty Officer Sub-specialty<br>Civil Engineer Corps Sub-specialty |

TABLE 3 (Cont)

| CIS Code | Occupational Title | Navy Officer Specialty |
|---|---|---|
| 1184 | Buyer and Purchasing Agent | Supply Corps Sub-specialty |
| 1186 | Personnel Manager | Unrestricted Line Officer Sub-specialty<br>Limited Duty Officer Sub-specialty<br>Warrant Officer Sub-specialty |
| 1195 | Public Relations Worker | Public Affairs Officer |
| 1411 | Office Manager | Unrestricted Line Officer Sub-specialty<br>Limited Duty Officer Sub-specialty<br>Warrant Officer Sub-specialty |
| 1412 | Secretary | Limited Duty Officer Sub-specialty<br>Warrant Officer Sub-specialty |
| 1614 | Accountant and Auditor | Supply Corps Sub-specialty |
| 1616 | Bookkeeper | Supply Corps Sub-specialty |
| 1684 | Programmer and Systems Analyst | Unrestricted Line Officer Sub-specialty<br>Supply Corps Sub-specialty |
| 1686 | Computer Operator | Unrestricted Line Officer Sub-specialty<br>Supply Corps Sub-specialty |
| 2144 | Social Scientist | Unrestricted Line Officer Sub-specialty<br>Chaplain Corps Sub-specialty |
| 2164 | Social Program Planner | Unrestricted Line Officer Sub-specialty<br>Chaplain Corps Sub-specialty |
| 2176 | Reporter and Editor | Public Affairs Officer Sub-specialty |
| 2316 | Architect | Civil Engineer Corps |
| 2332 | Mathematician and Statistician | Unrestricted Line Officer Sub-specialty<br>Supply Corps Sub-specialty |

TABLE 3 (Cont)

| CIS Code | Occupational Title | Navy Officer Specialty |
|---|---|---|
| 2354 | Engineer | Civil Engineer Corps<br>Unrestricted Line Officer Sub-specialty<br>Engineering Duty Officer<br>Aeronautical Engineering Duty Officer |
| 2356 | Engineering Technician | Limited Duty Officer (Civil Engineer)<br>Warrant Officer (Civil Engineer) |
| 2624 | Physical Scientist | Unrestricted Line Officer Sub-specialty<br>Engineering Duty Officer Sub-specialty<br>Aeronautical Engineering Duty Officer Sub-specialty |
| 2626 | Earth Scientist | Geophysics Officer |
| 2644 | Optician | Medical Service Corps<br>Warrant Officer (Physician's Assistant) |
| 2654 | Medical Technologist | Medical Service Corps<br>Warrant Officer (Physician's Assistant) |
| 2656 | Laboratory Tester | Civil Engineer Corps Sub-specialty<br>Engineering Duty Officer Sub-specialty<br>Aeronautical Engineering Duty Officer Sub-specialty<br>Limited Duty Officer Sub-specialty<br>Warrant Officer Sub-specialty |
| 2672 | Quality Control Inspector | Unrestricted Line Officer Sub-specialty<br>Engineering Duty Officer Sub-specialty |

TABLE 3 (Cont)

| CIS Code | Occupational Title | Navy Officer Specialty |
|---|---|---|
| 2672 (Cont) | Quality Control Inspector (Cont) | Aeronautical Engineering Duty Officer Sub-specialty<br>Limited Duty Officer Sub-specialty<br>Warrant Officer Sub-specialty |
| 4222 | Powderman | Limited Duty Officer Sub-specialty<br>Warrant Officer Sub-specialty |
| 4734 | Photographer | Limited Duty Officer (Photography)<br>Warrant Officer (Photographer) |
| 6126 | Air Traffic Controller | Limited Duty Officer (Aviation Operations)<br>Warrant Officer (Aviation Operations Technician)<br>Unrestricted Line Officer Sub-specialty |
| 6184 | Ship Officer and Engineer | Unrestricted Line Officer<br>Restricted Line Officer<br>Limited Duty Officer<br>Warrant Officer |
| 6188 | Pilot and Flight Engineer | Unrestricted Line Officer<br>Aeronautical Engineering Duty Officer |
| 7116 | Shipping and Receiving Clerk | Supply Corps Sub-specialty<br>Limited Duty Officer (Supply)<br>Warrant Officer (Supply Clerk) |
| 7118 | Stock Clerk | Supply Corps Sub-specialty<br>Limited Duty Officer (Supply)<br>Warrant Officer (Supply Clerk) |

TABLE 3 (Cont)

| CIS Code | Occupational Title | Navy Officer Specialty |
|---|---|---|
| 8112 | Physician | Medical Corps |
| 8113 | Dentist | Dental Corps |
| 8115 | Optometrist | Medical Corps Sub-specialty<br>Medical Service Corps Sub-specialty |
| 8116 | Dietitian | Medical Corps Sub-specialty<br>Medical Service Corps Sub-specialty |
| 8117 | Physician's Assistant | Warrant Officer (Physician's Assistant)<br>Medical Service Corps Sub-specialty |
| 8124 | Pharmacist | Medical Service Corps Sub-specialty<br>Warrant Officer Sub-specialty |
| 8126 | Physical Therapist | Nurse Corps Sub-specialty<br>Medical Service Corps Sub-specialty |
| 8128 | Speech and Hearing Specialist | Medical Corps Sub-specialty<br>Nurse Corps Sub-specialty<br>Medical Service Corps Sub-specialty |
| 8162 | Registered Nurse | Nurse Corps |
| 8164 | Licensed Practical Nurse | Nurse Corps |
| 8414 | Counselor | Chaplain Corps Sub-specialty |
| 8416 | Caseworker | Chaplain Corps Sub-specialty |
| 8418 | Psychologist | Medical Corps Sub-specialty |
| 8424 | Social Service Specialist | Chaplain Corps Sub-specialty |
| 8432 | Lawyer | Judge Advocate General Corps |
| 8436 | Clergyman | Chaplain Corps |
| 9824 | Radio and Television Announcers | Public Affairs Officers |

## Shipboard Organization Chart

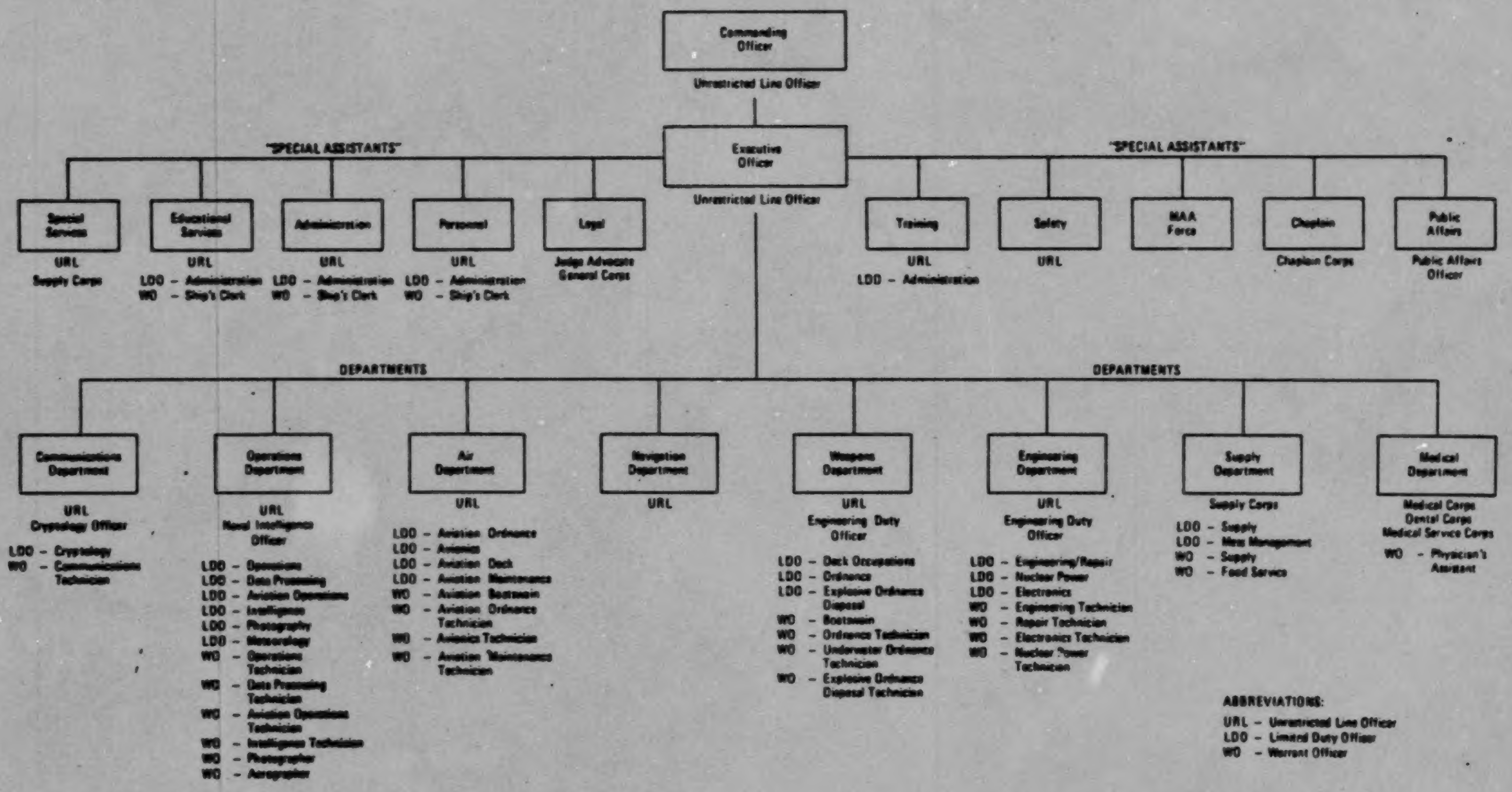
To illustrate the manner in which Navy enlisted ratings and officer specialties are organized to carry out the work of the Navy, a typical shipboard organization is depicted in Table 4 (Officers) and Table 5 (Enlisted). The boxes on the tables may be thought of as offices within the ship. The officer categories (Table 4) and the enlisted ratings (Table 5) typically assigned to each office are listed under each box.

In Table 4, note that an Unrestricted Line Officer (URL) might be assigned to any one of a number of offices, while a more specialized officer, like a Warrant Officer-Engineering Technician, normally would be assigned only to the Engineering Department. The number of officers on any ship will depend on its size and mission. On smaller ships, a single officer might serve as a "Special Assistant" for Administration, for Educational Services and for Public Affairs, while on larger ships, an officer would normally be assigned to only one "Special Assistant" role.

In Table 5, some ratings, like Yeoman, are listed under several boxes indicating that they are routinely assigned to any one of a number of offices. On smaller ships, as is the case with officers, enlisted personnel may provide support for more than one "Special Assistant" function. For example, on smaller ships, a Yeoman might perform tasks related to Administration, Educational Services and Training, while on larger ships, a Yeoman would normally perform tasks in support of a single "Special Assistant".

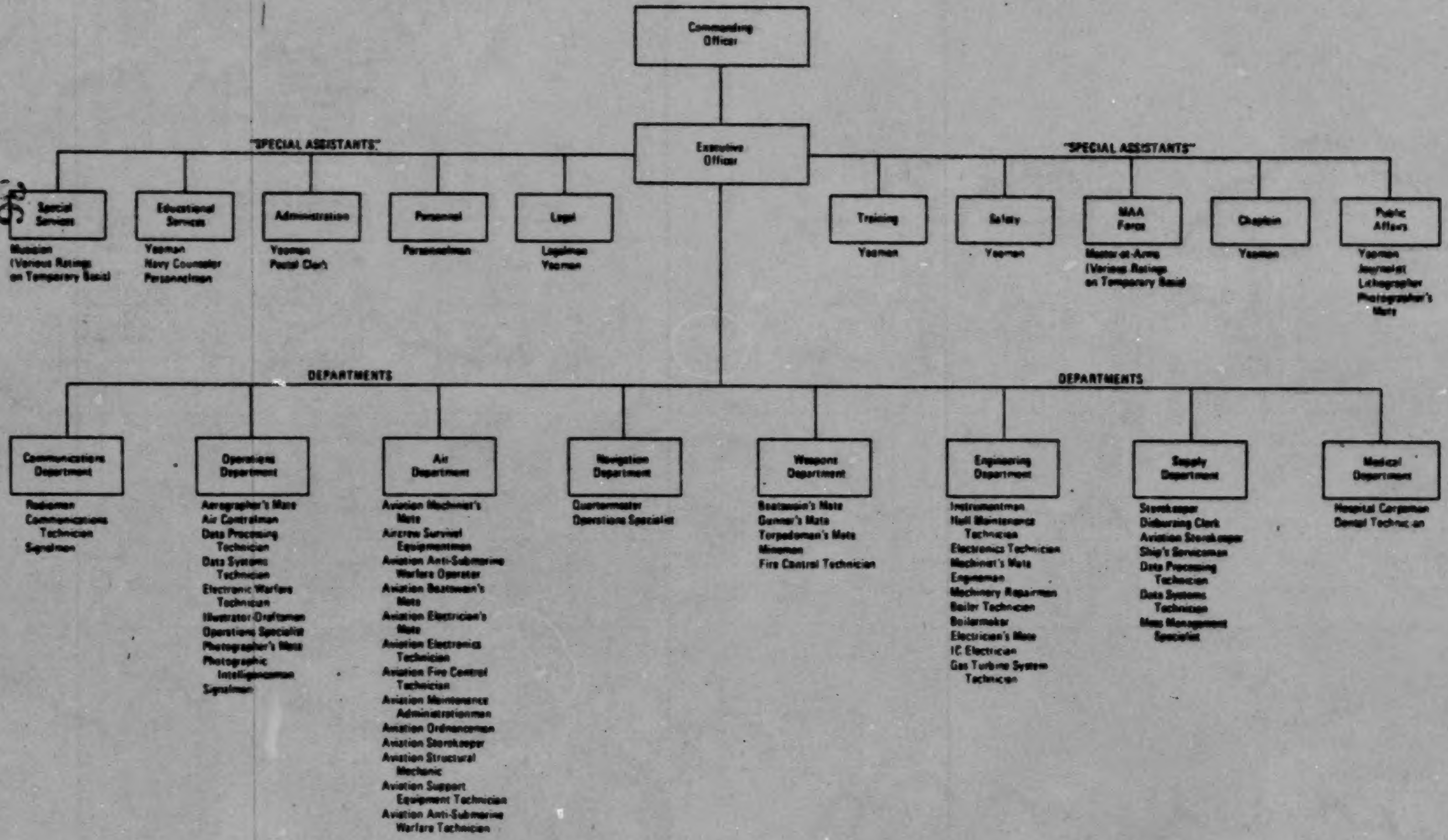
# TABLE 4

## SHIPBOARD OFFICER ORGANIZATION


Commanding Officer
Unrestricted Line Officer
Executive Officer
Unrestricted Line Officer
"SPECIAL ASSISTANTS"
Special Services
URL
Supply Corps
Educational Services
URL
LDO – Administration
WO – Ship's Clerk
Administration
URL
LDO – Administration
WO – Ship's Clerk
Personnel
URL
LDO – Administration
WO – Ship's Clerk
Legal
Judge Advocate General Corps
"SPECIAL ASSISTANTS"
Training
URL
LDO – Administration
Safety
URL
MAA Force
Chaplain
Chaplain Corps
Public Affairs
Public Affairs Officer
DEPARTMENTS
DEPARTMENTS
Communications Department
URL
Cryptology Officer
LDO – Cryptology
WO – Communications Technician
Operations Department
URL
Naval Intelligence Officer
LDO – Operations
LDO – Data Processing
LDO – Aviation Operations
LDO – Intelligence
LDO – Photography
LDO – Meteorology
WO – Operations Technician
WO – Data Processing Technician
WO – Aviation Operations Technician
WO – Intelligence Technician
WO – Photographer
WO – Aerographer
Air Department
URL
LDO – Aviation Ordnance
LDO – Avionics
LDO – Aviation Deck
LDO – Aviation Maintenance
WO – Aviation Boatswain
WO – Aviation Ordnance Technician
WO – Avionics Technician
WO – Aviation Maintenance Technician
Navigation Department
URL
Weapons Department
URL
Engineering Duty Officer
LDO – Deck Occupations
LDO – Ordnance
LDO – Explosive Ordnance Disposal
WO – Boatswain
WO – Ordnance Technician
WO – Underwater Ordnance Technician
WO – Explosive Ordnance Disposal Technician
Engineering Department
URL
Engineering Duty Officer
LDO – Engineering/Repair
LDO – Nuclear Power
LDO – Electronics
WO – Engineering Technician
WO – Repair Technician
WO – Electronics Technician
WO – Nuclear Power Technician
Supply Department
Supply Corps
LDO – Supply
LDO – Mess Management
WO – Supply
WO – Food Service
Medical Department
Medical Corps
Dental Corps
Medical Service Corps
WO – Physician's Assistant
ABBREVIATIONS:
URL – Unrestricted Line Officer
LDO – Limited Duty Officer
WO – Warrant Officer

## TABLE 5

## SHIPBOARD ENLISTED ORGANIZATION


Commanding Officer
Executive Officer
"SPECIAL ASSISTANTS"
Special Services
Musician
(Various Ratings on Temporary Basis)
Educational Services
Yeoman
Navy Counselor
Personnelman
Administration
Yeoman
Postal Clerk
Personnel
Personnelman
Legal
Legalman
Yeoman
"SPECIAL ASSISTANTS"
Training
Yeoman
Safety
Yeoman
MAA Force
Master-at-Arms
(Various Ratings on Temporary Basis)
Chaplain
Yeoman
Public Affairs
Yeoman
Journalist
Lithographer
Photographer's Mate
DEPARTMENTS
Communications Department
Radioman
Communications Technician
Signalman
Operations Department
Aerographer's Mate
Air Controlman
Data Processing Technician
Data Systems Technician
Electronic Warfare Technician
Illustrator-Draftsman
Operations Specialist
Photographer's Mate
Photographic Intelligenceman
Signalman
Air Department
Aviation Machinist's Mate
Aircrew Survival Equipmentman
Aviation Anti-Submarine Warfare Operator
Aviation Boatswain's Mate
Aviation Electrician's Mate
Aviation Electronics Technician
Aviation Fire Control Technician
Aviation Maintenance Administrationman
Aviation Ordnanceman
Aviation Storekeeper
Aviation Structural Mechanic
Aviation Support Equipment Technician
Aviation Anti-Submarine Warfare Technician
Navigation Department
Quartermaster
Operations Specialist
DEPARTMENTS
Weapons Department
Boatswain's Mate
Gunner's Mate
Torpedoman's Mate
Mineman
Fire Control Technician
Engineering Department
Instrumentman
Hull Maintenance Technician
Electronics Technician
Machinist's Mate
Engineman
Machinery Repairman
Boiler Technician
Boilermaker
Electrician's Mate
IC Electrician
Gas Turbine System Technician
Supply Department
Storekeeper
Disbursing Clerk
Aviation Storekeeper
Ship's Serviceman
Data Processing Technician
Data Systems Technician
Mess Management Specialist
Medical Department
Hospital Corpsman
Dental Technician

# THE WORK OF THE NAVY

## The General Work of the Navy

Much of the work of the Navy depends heavily on very advanced technology. Surface ships and submarines, aircraft, ballistic and cruise missiles, engines fueled with nuclear as well as diesel energy, hydraulic systems, radars, sonars, electronic computers and controls, automotive equipment—all of these are essential to the Navy. As a result, many Navy people are involved in the operation and maintenance of such equipment.

The size of the Navy also demands that many people be working to communicate within the Navy, with the other armed services, and with the civilian part of the American community. Many Navy people work in offices, (either ashore or aboard ship) typing, keeping records, accounting for money and materials, and planning the orderly movement of ships, planes, and people around the world.

Other Navy occupations are involved in the construction, maintenance and operation of support facilities at naval bases in the United States and overseas. Such facilities as hospitals, medical and dental clinics, supply centers, shipyards and aircraft overhaul plants are maintained, operated and sometimes built by Navy personnel. Many officers and enlisted personnel, with various specialties and ratings, perform work at these and other support activities.

Many Navy occupations are directly related to combat and the work of Navy men in these occupations during peacetime is performed so as to ensure their ability to perform their work effectively during combat. The men who operate the propulsion equipment which gives.the ship the ability to move about; the men who operate power-generating equipment which provides the hydraulic, steam and electrical power necessary to operate the weapons systems on board; the men who actually operate the weapons systems; the men who maintain communications systems throughout the ship; the men who provide food and other services for the crew; all of these men and others practice constantly, by conducting drills and by testing equipment operation, to ensure their readiness for combat. Much of the Navy's peacetime work, therefore, is spent in maintaining and improving skills that would be necessary in times of actual combat.

A Navy ship, even a huge aircraft carrier, is crowded with all of the personnel and equipment that must be carried to accomplish the ship's mission. In the table below, the length, the width (called "beam") and the approximate number of personnel assigned are listed for several types of Navy ships.

TABLE 6

SIZE AND PERSONNEL ASSIGNED TO NAVY SHIPS

| Ship Type | Length | Beam | Personnel Assigned |
|---|---|---|---|
| Aircraft Carrier | 1,062 ft | 252 ft (at widest part of flight deck) | 5,500 |
| Cruiser | 600 ft | 66 ft | 1,200 |
| Frigate | 560 ft | 60 ft | 500 |
| Destroyer | 420 ft | 45 ft | 300 |
| Patrol Gunboat | 165 ft | 30 ft | 25 |
| PT Boat | 95 ft | 23 ft | 20 |
| Ammunition Ship | 560 ft | 80 ft | 400 |
| Oiler | 660 ft | 80 ft | 360 |
| Ballistic Missile Submarine | 425 ft. | 33 ft | 140 |
| Attack Submarine | 360 ft | 33 ft | 100 |

There are other special features of Navy work. A Navy ship at sea must be self-supporting which means that she (a Navy ship is always referred to as "she" or "her") must provide all of her own cooking, laundry service, medical and dental service, fire protection, police force and recreational service.

In civilian society, few if any of these services are provided right in the plant or business itself and the people who provide them usually do not perform other work in the plant or business. These services are provided by separate groups in our society and are paid for by taxes (police and firemen) or by charges to their customers (doctors, dentists, janitors, restaurant operators, launderers, etc.).

A ship does not have the space to include the crew plus an additional large group of people to perform all of the services mentioned above. So the crew must provide these services for themselves. When possible, medical and dental personnel are placed aboard since specially trained people are required for these services.

As a result, sailors from each part of a ship take their turn working in the kitchens (called galleys) or in the laundries or on the police force (called a Master-at-Arms force which keeps order about the ship) or as cleaners for the sleeping spaces, mess decks (eating places) and toilets (called heads). They may also be assigned to a "Special Services" organization which provides recreation, entertainment and library services.

The sailors assigned to these jobs are the newest members of the crew. By employing new personnel as cooks' helpers or as cleaners, the other sailors are free to operate and repair the ship's equipment, jobs which require training and experience. Not all of the new sailors aboard ship are required for services at the same time, so they take turns. Boilermen, yeomen, electricians, machinists and technicians all take their turn. It may mean that a sailor who has completed recruit training and has attended a technical school for electricians, may be delayed slightly (perhaps 90 days) before actually becoming involved in the work of an electrician. While this can be frustrating at first, the sailors generally come to realize that their services are very important to the morale of the crew and, therefore, to the overall capability of the ship to carry out her mission.

Another special feature of Navy work is that a ship must perform her mission 24 hours a day with only one crew. This means that the equipment on a ship must operate 24 hours a day and must be attended constantly. Some services like fire prevention must also be provided constantly. To accomplish these tasks the Navy assigns sailors to "watches" throughout the day, usually for periods of four hours at a time. "Watches" are somewhat like "shifts" in civilian life. During watches sailors may act as lookouts or as guards against fire in a compartment or as security guards to make sure equipment is stowed or held securely. They may actually operate equipment (like manning a radar-console) or they may observe equipment to make sure it is operating properly (like watching an electrical panel to make sure that generators are providing the proper amount of electricity). Some watches, like a fire watch, may have little to do with a sailor's regular work, while other watches, like watching the water level in the boilers, may involve watching a boiler the sailor may have worked on that very day. Before, during, or after the regular work a sailor does in his shop, he will be called upon to stand a watch. Since some watches take place at unusual hours (perhaps from midnight to four o'clock in the morning) a sailor's schedule is arranged so that he will always have the opportunity to eat properly and to get the proper amount of rest.

Another special feature of Navy work is that at times a ship must be ready to actually fight—to defend herself or attack an enemy. When that situation occurs, "battle stations" are manned. All of the ship's equipment is turned on, including back-up equipment, and extra personnel are present to make sure all of the equipment operates properly. All of the watches are manned and everyone else on the ship—including cleaners and cooks' helpers, and the sailors who work in offices such as yeomen and legalmen—all go to specially assigned stations throughout the ship where they will repair damage and fight fires if they occur during combat operations. When all of the sailors are at the proper "battle station", every compartment is closed up to guard against flooding and the regular routine of the ship is postponed until the danger has passed.

To man "battle stations" quickly requires a great amount of coordination and communication throughout the ship. Practice drills are held frequently while a ship is at sea to ensure that each person knows his assigned station; that he can reach it quickly; and that he can properly operate the equipment at his station. Combat situations, including shipboard damage and personnel casualties, are simulated to demonstrate the teamwork required to effectively operate all of the systems and equipment on the ship during actual combat. "Battle station" drills are something like the drills that football teams go through when learning new plays and defensive formations, or like the drills that firemen perform before they ever actually fight a fire.

## Shipboard Routine in the Navy

On a given day, a sailor's routine is determined by his watch schedule for that day. A typical day at sea might be as follows:

| Time | Activity | Description |
|---|---|---|
| 6:00 AM | Reveille | Sailor arises, cleans up, dresses, makes his bunk and stores his personal gear in his locker. |
| 6:30 AM | Breakfast | |
| 7:00 AM | Quarters for Muster | Sailor goes to his shop or to the area on deck where his division meets at the start of each day. |
| 8:00 AM thru 11:15 AM | Regular Ship's Work | Sailor performs assigned work on the ship's equipment. A certain amount of this time will be used for training lectures and for on-the-job training (training accomplished by actually performing the work under supervision of a qualified sailor). If the sailor is temporarily performing the work of a compartment cleaner, he will commence his regular cleaning duties at this time. |
| 11:15 AM | Dinner | |
| 11:45 AM | Relieve the Watch | Sailor relieves the man who is standing watch on the boilers or perhaps relieves the man who is on a fire watch in a compartment. |
| 3:45 PM | Relieve the Watch | Sailor is relieved by another man and is free to clean up and prepare for supper. Since the regular work of the ship usually stops at 4:00 PM it may not be necessary for the sailor to go back to his shop. |
| 5:00 PM | Supper | Supper is followed by free time. |

| Time | Activity | Description |
|---|---|---|
| 8:00 PM | Movie Call | There may be a movie for those not on watch. This may also be more free time for writing, reading, studying or talk sessions. The sailor may want to go to bed early because he has another watch coming up. |
| 10:00 PM | Taps | Lights out. The ship goes to bed except for those on watch. |
| 11:45 PM | Relieve the Watch | Time for another watch. This one will last until 3:45 AM. |

After completing his watch just before four in the morning, this sailor would then be able to sleep until 7:00 AM. His next day's watch would be at 4:00 PM (one of two short watches during the day) and would be over at 6:00 PM. He could then sleep for more than eight hours if he desired because his next watch would begin the next morning at 4:00 AM. It can be said then that a sailor stands a series of scheduled watches. Any time he is not on watch between eight in the morning and four in the afternoon, he performs work assigned in his shop. After four in the afternoon, his time is generally his own, if he is not on watch, unless the ship is taking part in special exercises or there are repairs to equipment which require everyone to perform extra work.

When a ship is in port, the routine of the ship is the same as at sea from seven-thirty in the morning to four in the afternoon. After 4:00 PM, however, only a portion of the crew is required to remain aboard for watch standing. Others can go home or on liberty until the next morning. If a ship has four sections to stand watches, a sailor would have to remain aboard one night in four; if there are six sections, he would remain aboard one night in six. Ships in port or at their home base make every attempt to arrange for six sections of watch standers so that the crew can have a maximum amount of time at home. As an example, much of the equipment on the ship is shut down which reduces the number of watch standers required.

## Shipboard Life

All Navy ships are crowded. Within a ship there are so many sailors performing different types of work that the lack of space is usually a hardship on each individual at first. But sailors generally adjust to this condition, and the lack of space can bring out a spirit of understanding, patience, and cooperation. Men must learn to respect each other's feelings and develop a group spirit that makes living aboard ship more agreeable and, for some, enjoyable. This means too that sailors have to learn to get along with people from all parts of the country; with people of different races and religions; with people of various physical and mental abilities; and with people who have many different interests. Because sailors travel to foreign countries, they must also learn to accept and appreciate the people and the customs of these countries, even though they may be very different from those of the United States.

Close living conditions and long periods away from home require that all sailors recognize that some actions have a harmful effect on safety and morale. The use of drugs or alcohol, aboard ship, is extremely dangerous for the individual, for other sailors and for the ship itself because of the presence of so much mechanical and electrical equipment. Such behavior is not acceptable aboard ship. Close living conditions also require that sailors maintain high standards of honesty and personal cleanliness. Sailors have very little space for their personal belongings and the ones they have are usually very important to them. To lose something through theft is doubly frustrating to a person who has only a few items with him in the first place. Theft of any item, regardless of its value, is intolerable not just to authorities, but to every sailor aboard the ship. The mistrust and suspicions aroused when theft occurs may carry over to the essential work of the ship. Sailors may lack confidence in one another. Without complete trust and confidence in each other, sailors may find it very difficult to operate as a team even during combat and other dangerous situations.

Cleanliness also takes on new significance when living in close quarters. At times, sailors cannot help but get dirty in their work, but they must maintain minimum standards of cleanliness. Failure to maintain simple standards of cleanliness would result in unpleasant odors that create generally unpleasant conditions for everyone. Such a reduced level of personal hygiene would be especially unbearable in the living and eating areas of a ship. Laundry facilities are available for clothes and showers are available for sailors to use each day.

Sailors tend to unite around their work, and over a period of time, learn to depend on one another and to take pride and satisfaction in their work. Operating at sea demonstrates the importance of their ability to operate their equipment properly, to keep it in good repair, to know their equipment well enough to recommend improvements to it, and to keep their ship orderly and clean. Not all ships reach the same levels of cooperation, ability and satisfaction, but the constant challenge of trying to reach these goals can be stimulating and rewarding and demands the best efforts of each individual.

## Lengths of Cruises and Time Between Cruises

Separation from home and family is a fact of Navy life. The Navy's mission requires that men and ships spend extended periods of time at sea. The problems associated with long separations are a burden to sailors and to their families. Navy managers constantly review policies to determine ways to reduce these burdens and to distribute them equally among as many sailors and ships as possible.

The Navy does not look for ways to keep sailors from going to sea, but the Navy does look for ways to eliminate unnecessary time at sea. The high cost, in money and morale, of operating ships at sea makes it mandatory to ensure that all time spent at sea is necessary to the Navy's mission.

Whenever possible, operating schedules are arranged so as to limit periods away from home to a maximum of six months. Many factors and events can affect the Navy's ability to reach this goal of six months. A war such as the long war in Vietnam; a crisis in the Mediterranean like the Arab-Israeli war; ship overhaul periods; delays in ship construction; mechanical failures—any or all of these things can result in cruises extending beyond six months. (The term "cruise" refers to the total time away from the ship's home port. It includes time in foreign ports as well as time at sea. At-sea periods vary in length but are generally between 15 and 20 days.) During the Vietnam war, a few ships remained on cruise for over ten months and many others cruised for eight, nine, or nine and one-half months. The Arab-Israeli war, although we were not actually involved, still resulted in longer cruises for some of the ships with the Sixth Fleet in the Mediterranean.

A six-month cruise is not a rule, therefore, but a target. The desire to limit cruises to six months is an indication of the Navy's concern for the problems resulting from long separations.

The amount of time between cruises (called "turn-around" time) is also of great importance to sailors. The "turn-around" time between cruises is generally considered to be "short" if it extends for six months or less, and "long" if it extends for more than six months. This period between cruises provides an opportunity to rest the crew, to perform maintenance on the ship, to train new crew members, and to maintain or increase the training level of the experienced hands. As the time for departure on the next cruise approaches, more and more time must be spent at sea to test equipment and to measure the crew's proficiency in training exercises. These periods at sea are generally short—perhaps ten days or two weeks with time in between in port—and occur mainly during the last three months before a cruise.

If a ship were to experience only "short" turn-arounds, the sailors on that ship would obviously spend more time away from home than sailors on ships experiencing "long" turn-arounds or combinations of "short" and "long". Therefore, Navy managers constantly monitor plans and schedules to ensure that the burden is shared equally.

A ship may experience two "short" turn-arounds in a row, and some ships may have experienced more than two, but a constant effort is made to ensure that each ship is given her share of "long" turn-arounds.

It is important to note here that the same factors and events which prolong cruises (Vietnam war, etc.) can also reduce the length of turn-around time for a ship. Again there are no set rules but rather a general determination among Navy managers to ensure that the resulting burdens of separation are shared equally.

## "Shore Duty"—Work at Navy Shore Facilities

A very important part of the Navy's work is performed at shore facilities in the United States and overseas. Naval bases, air stations, repair facilities, research laboratories, training centers, schools, communications centers, supply centers, administrative staffs, and the main Navy headquarters staff in Washington—all perform vital work in support of the Navy's operating forces. Duty at such facilities is called "Shore Duty" and Navy men and women of all enlisted ratings and officer specialties participate in such work.

Naval bases, where ships are outfitted, berthed, maintained, repaired and resupplied, are organized under a commanding officer in a manner similar to the organization for a ship shown in Tables 4 and 5. Similar organizations also exist at naval air stations where patrol and training aircraft are based and where carrier-type aircraft are assigned during turn-around periods. One key "department," not included aboard ship but very important at naval bases and air stations, is a "Public Works Department." Navy men and women in this department maintain, repair, modify and, at times, construct the buildings, docks, hangars and equipment located at bases and air stations. They also provide the utilities necessary to support the activities at each base and air station.

Much of the work performed at naval shore facilities consists of: (a) providing training for Navy men and women; (b) developing plans and programs for fleet support; (c) arranging operating schedules; (d) providing maintenance facilities for ships and aircraft; (e) developing new equipment; (f) developing plans and maintaining records for personnel, including their assignment and rotational patterns; and (g) providing services for Navy men and women and their dependents.

As previously noted, Navy women are not assigned to combatant ships. However, the work listed above, performed at Navy shore facilities in the United States and overseas, requires a wide variety of occupational skills and provides a broad range of work opportunities for women. Many occupations which are performed aboard ship, are performed ashore as well. For example, work in aviation occupations is performed at naval air stations as well as aboard aircraft carriers. Requirements at naval bases provide similar opportunities for work in occupations which are also performed aboard ships at sea. Navy women work in these occupations and therefore participate fully in the work of the Navy, even though they do not work aboard combatant ships.

## Rotation Between "Sea Duty" and "Shore Duty"

There is a very significant difference between being assigned to "sea duty" and being assigned to "shore duty" in the Navy. While on "sea duty," a sailor will be assigned to a ship, a squadron or staff and will spend a good deal of time away from his home and family as we have discussed in the previous section on cruises. On the other hand, when a sailor is on "shore duty," he may attend school or work at a Navy base and will follow a fairly regular routine. His work week will probably be forty hours, with some additional time, usually one night per week, required for watch standing, and most weekends will be free. He will be able to observe holidays and in general, enjoy a regular family life.

Civilian employers may shift employees from place to place, but the Navy's situation is unique because rotating from shore duty to sea duty may cause a complete change in life style for the family. Moreover, it may mean breaking up a smoothly operating team—a practice civilian employers might be unlikely to follow.

There are a number of reasons why the Navy rotates personnel between shore duty and sea duty. Some of these reasons are: (a) to ensure that the burdens of separation are shared equally; (b) to provide an opportunity for training in new equipment, new procedures and new methods; (c) to update shore bases and training activities to reflect operations and conditions as they actually exist at sea; (d) to provide more sailors with real sea duty experience; and (e) to provide a change of pace and a more relaxed atmosphere for sailors who have been on sea duty for an extended period.

Most sailors are assigned to sea duty after recruit training or , in some cases, basic school training. This first sea-duty tour lasts for a minimum of three and a maximum of five years. They are then rotated to shore duty for a minimum of two years and, more often, for three or four years. Thereafter, sailors continue to rotate between sea duty and shore duty, with sea duty tours lasting an average of four years and shore duty tours lasting an average of three years.

Rotations between sea duty and shore duty are affected by a sailor's rating. Certain ratings, such as Musician and Journalist, have relatively few sea duty billets. Personnel in these ratings who remain in the Navy for twenty years may spend only six to eight years on sea duty. On the other hand, ratings such as Boatswain's Mate, Boiler Technician and Quartermaster have many sea duty billets and personnel in these ratings may spend twelve to fourteen years on sea duty during a twenty-year period with the Navy. Most Navy ratings, however, have rotational patterns which result in personnel spending from eight to twelve years on sea duty during a twenty-year period of service. An estimate of sea duty time for each rating is included in the rating description part of this manual.

## THE CHANGING NAVY

Like other large, modern organizations, the Navy is constantly changing in order to improve its operations and efficiency and to solve problems that reduce its effectiveness. In recent years, the Navy has changed many of its personnel procedures and has modernized its equipment. Records and information necessary for the selection and assignment of Navy personnel have been computerized. Rapid access to information has increased the efficiency of assignment and rotational procedures. The pay system has also been computerized resulting in fewer errors and in more information being available to the individual sailor.

Many old Navy ships have been retired from service, and this has meant less time away from home for many sailors. New ships are being designed to carry the most modern equipment and to perform more than one mission. An equal effort is being made to design ships with more comfortable living spaces for the crew.

Some ships are currently being "home-ported" at overseas bases rather than at bases along our own coasts. Since many families live at the overseas "home-port," this procedure reduces the amount of time spent away from home. It also affords Navy families the opportunity to visit and live, for a period of time, in other areas of the world.

All of these changes require work that will extend into the future. As a result, many Navy people are involved in the work of planning, organizing and making these improvements in the Navy.

## HOW THE NAVY HIRES

### General Practices

Because the Navy is a national employer that operates in many locations in the U.S. and other countries, the Navy has representatives-recruiters-in many towns and cities. Their job is to hire people to work for the Navy. Before they became recruiters, they were working in another job on a Navy ship or at a Navy shore facility. When their recruiting duty is completed, after about three years, they probably will return to other duties that are more closely related to actual naval operations.

Recruiters are assisted by Navy Vocational Interviewer and Placement Counselors. These counselors are Navy Personnelmen who have undergone special training as interviewers and classifiers. While the primary activity of recruiters is convincing people to join the Navy, the primary activities of Vocational Interviewer and Placement Counselors are administering tests, conducting interviews to determine the applicant's background and interest, determining the applicant's qualifications and counseling applicants about available programs for which they may be qualified. The counselor's involvement with the applicant takes place before any enlistment contract is signed.

In doing their job of convincing, recruiters describe the Navy and its work, pay, benefits, schools, travel and retirement programs. Understandably, because the recruiter's goal is to hire people, they make the Navy sound attractive. Counselors describe various Navy programs and assist applicants in selecting an available program which satisfies both Navy requirements and the applicants interest and qualifications. Together, recruiters and counselors are not supposed to lie about or cover-up the difficult aspects of being a sailor. The Navy Recruiting Command, which supervises all Navy recruiters and counselors, repeatedly emphasizes that the Navy is proud of its sailors and its work, and that recruiters and classifiers do not need to over-sell the Navy or hide the fact that sailors work hard.

Regardless of how much time the recruiter and counselor spend with a person, or the number of tests the applicant takes, the applicant is under absolutely no obligation either to the recruiter or the Navy. Obligation is involved only when the applicant signs the Armed Forces Enlistment Contract.

Recruiters and counselors have a wide variety of materials that help them to describe the Navy. Booklets, slides, and videotapes are available, each of which gives a different view of the Navy. Especially helpful to persons who are interested in working for the Navy are the "Rating Orientation Films" that describe the various Navy occupations.

If an applicant shows an interest in a Navy program or school, the recruiter will attempt to find out if and when an opening exists in the program or school. Sometimes this can be done immediately over the telephone. In other cases, circumstances may delay the process slightly.

The Navy enlistment programs and schools are filled at times. This means that an individual cannot always gain immediate entry into a program or school and may have to wait several months before an opening in a specific program becomes available. Because of this possibility, it is to the advantage of the individual to begin investigating about opportunities in the Navy several months before the time he actually wants to begin his Navy service.

### Direct Procurement Petty Officer Program

While most applicants enlist in the Navy at the lowest entry level, pay grade E-1, some applicants may qualify for entry at a higher level. The Navy's Direct Procurement Petty Officer Program provides an opportunity for applicants to enter the Navy at pay grades E-4 through E-7 if they have the required work experience. As an example, an applicant with four years of work experience as an electrician, six months of which was spent in a supervisory position, may be accepted for entry at pay grade E-5 if he meets certain age and aptitude requirements. Moreover, two years or 2,000 hours of vocational or technical training may be substituted for two of the required four years of work experience.

### Nature of Enlistment Contract and Oath

The Armed Forces Enlistment Contract is the basic agreement by which an individual becomes a member of the Armed Services. This agreement combined with the Oath of Enlistment assures that a sailor will stay with the Navy for a specified period of time as clearly stated on the document. This commitment to work for a fixed period is necessary because the Navy must hold its team together, regardless of the hardships or dangers that can arise.

This commitment is very serious because if a sailor breaks it by deserting or being absent from work without permission, he or she will hurt the overall effort of the Navy to carry out her mission, and he or she will be subject to Commanding Officer's punishment or court-martial action under military law.

Most sailors serve for four years without experiencing any trouble, and many serve for twenty years or more. But it is clear that a person should very carefully consider the seriousness of the enlisted contract before enlisting.

Persons who are considering going to work for the Navy should do the following:

(a) Be sure they know as much about the Navy as they can.

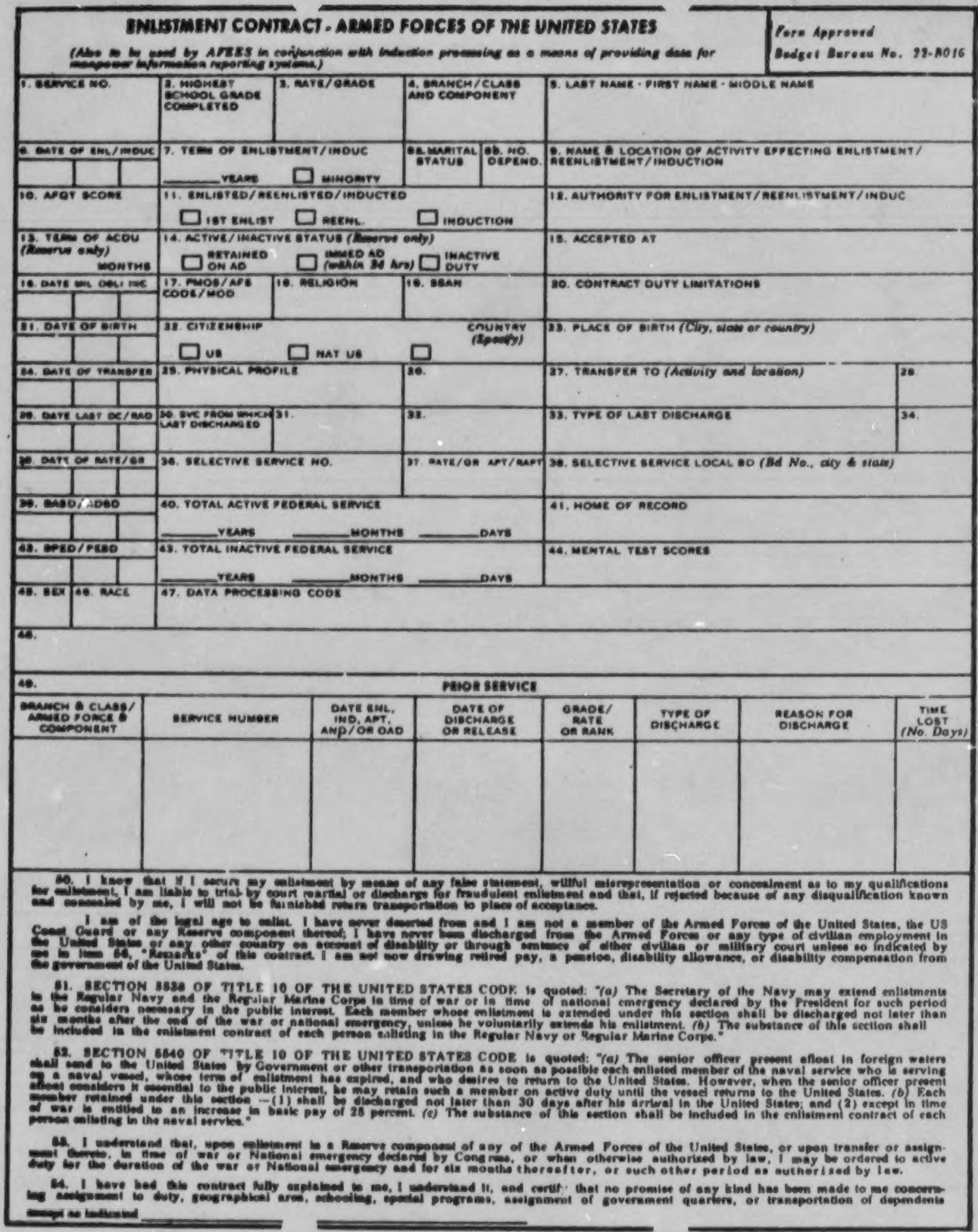
(b) Be sure they have a good idea of how they can help the Navy do its work and of what kinds of occupations they want to pursue in the Navy.

(c) Be sure they understand everything that the Navy recruiter has told them about the training, opportunities, and benefits that they are entitled to and what the Navy can and cannot guarantee.

(d) Be sure that they know that they will have the opportunity to develop their abilities in the Navy, but that this will require hard work.

(e) Be quite sure that they are self-disciplined enough to stand by the enlistment commitment.

A copy of the Enlistment Contract is included here to familiarize readers with the actual contract (see Figure 1).



**ENLISTMENT CONTRACT - ARMED FORCES OF THE UNITED STATES**

*(Also to be used by AFEES in conjunction with induction processing as a means of providing data for manpower information reporting systems.)*

*Form Approved*
*Budget Bureau No. 22-R016*

1. SERVICE NO.
2. HIGHEST SCHOOL GRADE COMPLETED
3. RATE/GRADE
4. BRANCH/CLASS AND COMPONENT
5. LAST NAME - FIRST NAME - MIDDLE NAME
6. DATE OF ENL/INDUC
7. TERM OF ENLISTMENT/INDUC ______ YEARS ☐ MINORITY
8a. MARITAL STATUS
8b. NO. DEPEND.
9. NAME & LOCATION OF ACTIVITY EFFECTING ENLISTMENT/REENLISTMENT/INDUCTION
10. AFQT SCORE
11. ENLISTED/REENLISTED/INDUCTED ☐ 1ST ENLIST ☐ REENL. ☐ INDUCTION
12. AUTHORITY FOR ENLISTMENT/REENLISTMENT/INDUC
13. TERM OF ACDU *(Reserve only)* MONTHS
14. ACTIVE/INACTIVE STATUS *(Reserve only)* ☐ RETAINED ON AD ☐ IMMED AD *(within 24 hrs)* ☐ INACTIVE DUTY
15. ACCEPTED AT
16. DATE MIL OBLI INC
17. PMOS/AFS CODE/MOD
18. RELIGION
19. SSAN
20. CONTRACT DUTY LIMITATIONS
21. DATE OF BIRTH
22. CITIZENSHIP ☐ US ☐ NAT US ☐ COUNTRY *(Specify)*
23. PLACE OF BIRTH *(City, state or country)*
24. DATE OF TRANSFER
25. PHYSICAL PROFILE
26.
27. TRANSFER TO *(Activity and location)*
28.
29. DATE LAST DC/RAD
30. SVC FROM WHICH LAST DISCHARGED
31.
32.
33. TYPE OF LAST DISCHARGE
34.
35. DATE OF RATE/GR
36. SELECTIVE SERVICE NO.
37. RATE/GR APT/RAPT
38. SELECTIVE SERVICE LOCAL BD *(Bd No., city & state)*
39. BASD/ADSD
40. TOTAL ACTIVE FEDERAL SERVICE ______ YEARS ______ MONTHS ______ DAYS
41. HOME OF RECORD
42. BPED/PEBD
43. TOTAL INACTIVE FEDERAL SERVICE ______ YEARS ______ MONTHS ______ DAYS
44. MENTAL TEST SCORES
45. SEX
46. RACE
47. DATA PROCESSING CODE
48.
49. PRIOR SERVICE

| BRANCH & CLASS/ ARMED FORCE & COMPONENT | SERVICE NUMBER | DATE ENL, IND, APT, AND/OR OAD | DATE OF DISCHARGE OR RELEASE | GRADE/ RATE OR RANK | TYPE OF DISCHARGE | REASON FOR DISCHARGE | TIME LOST *(No. Days)* |
|---|---|---|---|---|---|---|---|
| | | | | | | | |

50. I know that if I secure my enlistment by means of any false statement, willful misrepresentation or concealment as to my qualifications for enlistment, I am liable to trial by court martial or discharge for fraudulent enlistment and that, if rejected because of any disqualification known and concealed by me, I will not be furnished return transportation to place of acceptance.

I am of the legal age to enlist. I have never deserted from and I am not a member of the Armed Forces of the United States, the US Coast Guard or any Reserve component thereof; I have never been discharged from the Armed Forces or any type of civilian employment in the United States or any other country on account of disability or through sentence of either civilian or military court unless so indicated by me in item 56, "Remarks" of this contract. I am not now drawing retired pay, a pension, disability allowance, or disability compensation from the government of the United States.

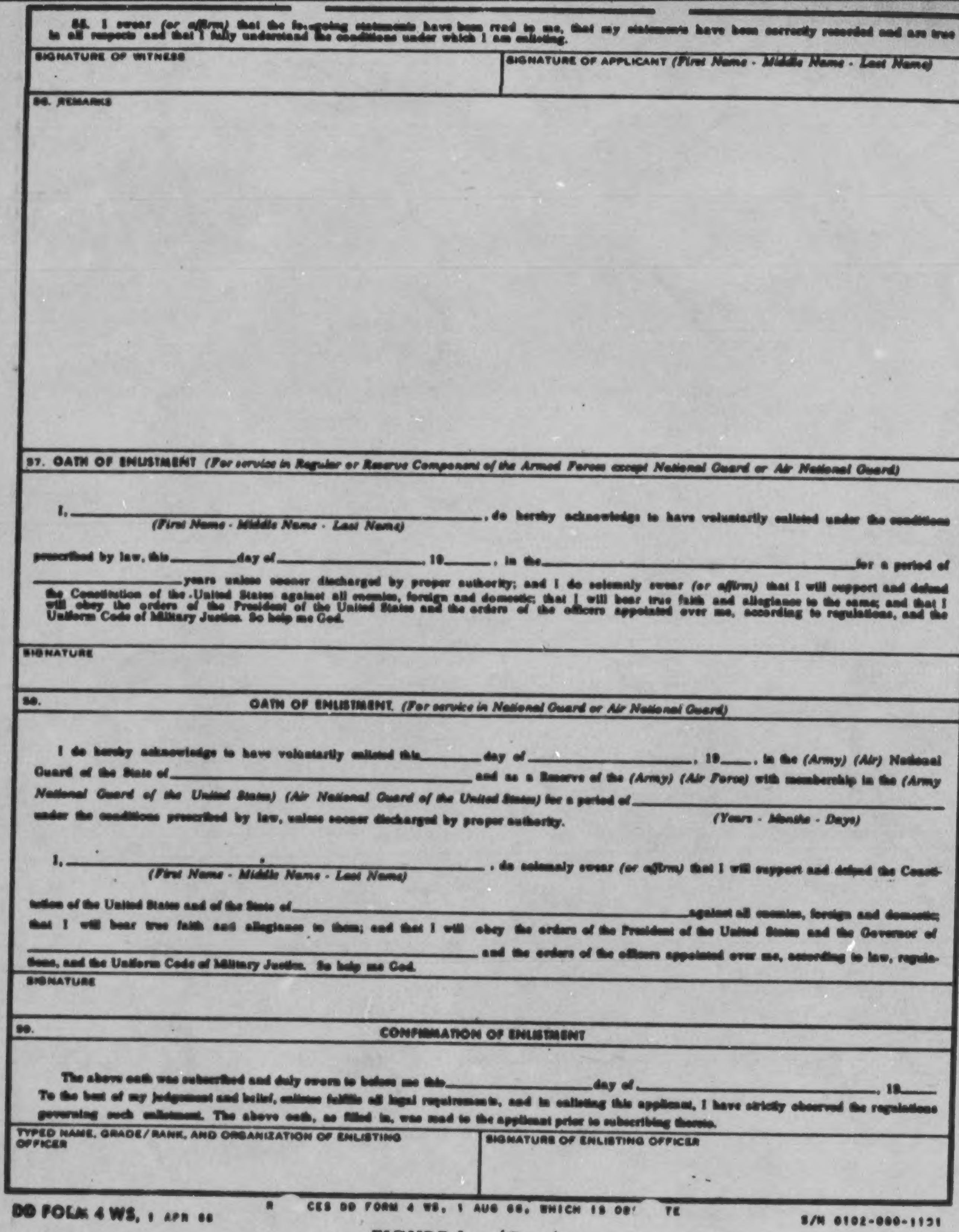
51. SECTION 5538 OF TITLE 10 OF THE UNITED STATES CODE is quoted: "*(a)* The Secretary of the Navy may extend enlistments in the Regular Navy and the Regular Marine Corps in time of war or in time of national emergency declared by the President for such period as he considers necessary in the public interest. Each member whose enlistment is extended under this section shall be discharged not later than six months after the end of the war or national emergency, unless he voluntarily extends his enlistment. *(b)* The substance of this section shall be included in the enlistment contract of each person enlisting in the Regular Navy or Regular Marine Corps."

52. SECTION 5540 OF TITLE 10 OF THE UNITED STATES CODE is quoted: "*(a)* The senior officer present afloat in foreign waters shall send to the United States by Government or other transportation as soon as possible each enlisted member of the naval service who is serving on a naval vessel, whose term of enlistment has expired, and who desires to return to the United States. However, when the senior officer present afloat considers it essential to the public interest, he may retain such a member on active duty until the vessel returns to the United States. *(b)* Each member retained under this section --(1) shall be discharged not later than 30 days after his arrival in the United States; and (2) except in time of war is entitled to an increase in basic pay of 25 percent. *(c)* The substance of this section shall be included in the enlistment contract of each person enlisting in the naval service."

53. I understand that, upon enlistment in a Reserve component of any of the Armed Forces of the United States, or upon transfer or assignment thereto, in time of war or National emergency declared by Congress, or when otherwise authorized by law, I may be ordered to active duty for the duration of the war or National emergency and for six months thereafter, or such other period as authorized by law.

54. I have had this contract fully explained to me, I understand it, and certify that no promise of any kind has been made to me concerning assignment to duty, geographical area, schooling, special programs, assignment of government quarters, or transportation of dependents except as indicated ______

FIGURE 1. ENLISTMENT CONTRACT



55. I swear *(or affirm)* that the foregoing statements have been read to me, that my statements have been correctly recorded and are true in all respects and that I fully understand the conditions under which I am enlisting.

| | |
|---|---|
| SIGNATURE OF WITNESS | SIGNATURE OF APPLICANT *(First Name - Middle Name - Last Name)* |

56. REMARKS

57. OATH OF ENLISTMENT *(For service in Regular or Reserve Component of the Armed Forces except National Guard or Air National Guard)*

I, ______________________ *(First Name - Middle Name - Last Name)*, do hereby acknowledge to have voluntarily enlisted under the conditions prescribed by law, this ________ day of ________________, 19______, in the ______________________ for a period of ________________ years unless sooner discharged by proper authority; and I do solemnly swear *(or affirm)* that I will support and defend the Constitution of the United States against all enemies, foreign and domestic; that I will bear true faith and allegiance to the same; and that I will obey the orders of the President of the United States and the orders of the officers appointed over me, according to regulations, and the Uniform Code of Military Justice. So help me God.

SIGNATURE

58. OATH OF ENLISTMENT. *(For service in National Guard or Air National Guard)*

I do hereby acknowledge to have voluntarily enlisted this________ day of ________________, 19____, in the *(Army) (Air)* National Guard of the State of ______________________ and as a Reserve of the *(Army) (Air Force)* with membership in the *(Army National Guard of the United States) (Air National Guard of the United States)* for a period of ______________________ *(Years - Months - Days)* under the conditions prescribed by law, unless sooner discharged by proper authority.

I, ______________________ *(First Name - Middle Name - Last Name)*, do solemnly swear *(or affirm)* that I will support and defend the Constitution of the United States and of the State of ______________________ against all enemies, foreign and domestic; that I will bear true faith and allegiance to them; and that I will obey the orders of the President of the United States and the Governor of ______________________ and the orders of the officers appointed over me, according to law, regulations, and the Uniform Code of Military Justice. So help me God.

SIGNATURE

59. CONFIRMATION OF ENLISTMENT

The above oath was subscribed and duly sworn to before me this________________ day of ______________________, 19_____. To the best of my judgement and belief, enlistee fulfills all legal requirements, and in enlisting this applicant, I have strictly observed the regulations governing such enlistment. The above oath, as filled in, was read to the applicant prior to subscribing thereto.

| | |
|---|---|
| TYPED NAME, GRADE/RANK, AND ORGANIZATION OF ENLISTING OFFICER | SIGNATURE OF ENLISTING OFFICER |

DD FORM 4 WS, 1 APR 66 R[illegible]CES DD FORM 4 WS, 1 AUG 66, WHICH IS OB[illegible]TE S/N 0102-000-1131

FIGURE 1. (Cont)

## NAVY PAY

Sailor's pay can be viewed as existing of six parts: Basic Pay, Basic Allowances, Special Pay, Incentive Pay/Hazardous Duty Pay, Miscellaneous Pay and Allowances, and a Federal Tax Advantage.

### Basic Pay

This is a salary payment subject to Federal withholding tax. The amount of this salary payment is determined by rate or rank and by the total number of years of service.

### Basic Allowances

There are three basic allowances which may be considered to be extra payments to help meet certain expenses of Navy life: (1) Basic Allowance for Quarters; (2) Basic Allowance for Subsistence; and (3) Clothing Allowances.

The Basic Allowance for Quarters is an estimate of what housing is worth for a single sailor or a married sailor with a family. The Navy either provides this housing or pays this amount of money to sailors who can use this money to rent or buy housing. The amount of payment varies with rate and rank.

The Basic Allowance for Subsistence is a monthly payment for food. Sailors receive this allowance when they are not provided meals at government expense.

Clothing Allowances are granted to sailors when they first enter the Navy; when they wear clothing of a type not worn by most Navy personnel; and when they advance to Chief Petty Officer. Sailors are also provided a small amount each month for maintaining their uniforms.

### Special Pay

Special Pay includes extra pay received while on sea duty, proficiency pay (payments made to promote retention [illegible] personnel in ratings which require special training), reenlistment bonuses and diving pay. Amounts vary with rate and time of service.

### Incentive Pay/Hazardous Duty Pay

Incentive pay includes aviation pay, submarine duty pay, and pay for such duty as parachute jumping duty, demolition duty and salvage duty. Amounts vary with rate and time of service.

Hazardous duty pay is payment for service in combat zones and for peacetime duty subject to hostile fire. Payments amount to a flat $65.00 per month.

## Miscellaneous Pay and Allowances

Included in this category are overseas cost-of-living allowances, travel and transportation allowances and daily living allowances (called "per diem") while serving at temporary duty stations.

## Federal Tax Advantage

The housing that a sailor receives or the quarters allowance and food allowance a sailor receives are not subject to Federal tax. Civilian workers who do not receive housing and food allowances would have to pay tax on this amount of money if they received it as part of their salaries or wages. Thus, sailors are provided a tax advantage.

## Table of Navy Pay

Navy Basic Pay and the primary allowances (Quarters and Subsistence) for some rates and ranks after various lengths of service are listed in Table 7. (Amounts listed are those in effect as of 1 October 1974.)

The tax advantage enjoyed by sailors results from the fact that, of the pay listed in Table 7, only Basic Pay is taxed by the Federal Government. Quarters and Subsistence Allowances are tax free payments. For the Seaman listed in the table, his annual pay will amount to $6,976.80 but he will only be taxed on $4,572.00. Depending on the number of dependents the Seaman claims, his annual pay is effectively increased by four-hundred to four-hundred and fifty dollars.

## Other Pay Benefits

The Navy also provides medical care and dental care. While stationed ashore, sailors may also shop for food and groceries at the commissary, where prices are generally lower than in civilian supermarkets. Sailors may shop for clothing and household items at department stores called Base Exchanges (BX's), where prices are generally lower than in civilian stores. Because the use of

## TABLE 7

## NAVY PAY

| Rate or Rank | Years of Service | Basic Pay (Monthly) | Quarters Allowance (Monthly)* | Subsistence Allowance (Monthly) | Total (Monthly) |
|---|---|---|---|---|---|
| Seaman Recruit | Under 2 | $ 344.10 | (See Note) | (See Note) | $ 344.10 |
| Seaman | Under 2 | 398.40 | 110.70 | 72.30 | 581.40 |
| Petty Officer, Third Class | 3 | 462.90 | 128.10 | 72.30 | 663.30 |
| Petty Officer, Second Class | 6 | 546.60 | 146.40 | 72.30 | 765.30 |
| Petty Officer, First Class | 10 | 647.40 | 158.40 | 72.30 | 878.10 |
| Chief Petty Officer | 14 | 781.20 | 170.40 | 72.30 | 1,023.90 |
| Senior Chief Petty Officer | 20 | 948.30 | 181.80 | 72.30 | 1,202.40 |
| Master Chief Petty Officer | 22 | 1,138.80 | 194.40 | 72.30 | 1,405.50 |
| Ensign | Under 2 | 634.20 | 149.40 | 50.52 | 834.12 |
| Lieutenant-Junior Grade | 2 | 798.30 | 185.40 | 50.52 | 1,034.22 |
| Lieutenant | 4 | 1,108.20 | 206.40 | 50.52 | 1,365.12 |

Note: Quarters and Subsistence Allowances are not listed for Seaman Recruit because a Seaman Recruit will normally live in the barracks and will have his meals provided.

* Figures listed are for sailors with dependents.

medical facilities, dental facilities, commissaries and BX's is optional and varies greatly from sailor to sailor, the Navy has not published an estimate of the probable value of these benefits for all sailors, because such an estimate might be misleading especially for young, unmarried sailors.

All Navy personnel are also entitled to thirty days paid leave every year.

## Navy Retirement Benefits

The Navy's retirement program consists of retired pay and a number of retirement benefits. Retired pay is figured by taking two and one-half percent of the highest basic pay a sailor earned while on active duty and multiplying it by the total number of years served on active duty up to a maximum of 30 years. To qualify for retired pay, personnel must have completed more than 19½ years of active service. An E-7 who retires after 22 years of active service is considered in the following example.

| | |
|---|---|
| Highest pay-grade attained | E-7 |
| Total years of active service | 22 |
| Basic pay for pay-grade E-7 with 22 years of active service | $892.80/month |
| Multiply by 2.5 percent | .025 |
| | $ 22.32 |
| Multiply by total years of active service | 22 |
| Retired Pay | $491.04/month |

Retired Pay is increased when the cost of living rises a certain amount and remains at this higher level for three consecutive months.

There are two significant features of retired pay. First, retired pay is a reward for service. Navy personnel are not required to contribute a portion of their monthly pay in order to be eligible for retired pay. Secondly, payments begin immediately after separation from the Navy. Navy personnel do not have to wait until age 60 or 65 to draw retired pay. This second feature of Navy retired pay is very important because it means that a young man or women can work in the Navy for twenty years, then retire and receive retired pay immediately, and still be only 38 or 40 years old. In many cases his or her Navy experience will have provided an excellent background for related civilian careers.

There are other retirement benefits in the Navy's retirement program. Retired personnel and their dependents are eligible for medical care in government facilities. They enjoy permanent commissary and exchange privileges and they are permitted to travel on military transport aircraft on a space available basis.

## NAVY TRAINING AND EDUCATION

### Early Training in the Navy

The mission of the Navy is unlike that of any other employer. But the work that sailors perform is very much like the work civilian employees perform. Navy occupations are very similar to civilian occupations, but sailors must be ready to perform their work under combat conditions, conditions that demand stamina, courage, teamwork and unselfish concern for fellow sailors.

In civilian society, people generally learn to take care of their own interests first. They select occupations because they view them as being able to satisfy one or more of their needs. On entering the Navy, sailors generally select Navy occupations for the same reasons. But during their first nine weeks in the Navy, a period called Recruit Training, sailors are taught how their occupations will fit into the overall mission of a unit. They learn that they will engage in occupations within a Navy environment, an environment which must always allow for the rigors of combat and other emergencies like storms at sea. Tight schedules and unfamiliar demands are imposed to impress new sailors with the need for group and self-discipline and the need for obedience to authority to assure rapid response under conditions of stress.

The work done by sailors in their occupations and their ability to perform their work under great pressure during combat conditions are essential if the Navy is to be strong and effective in carrying out its mission.

Recruit Training seeks to impress on a sailor these unique features of what would otherwise be regular occupations found in the civilian portion of society.

The environment of Recruit Training is generally more intense than the daily routine that sailors are likely to experience when they go on to their regular occupations in the Navy. Nevertheless, this early training alerts sailors to what will be expected of them when they must perform their work under combat and other emergency conditions.

Continued Training in the Navy

After Recruit training, further training in the Navy takes place in three types of service schools: Class A, Class C, and Class P; in functional schools; in Fleet schools; and in factory schools.

Class A schools provide sailors with the basic knowledge necessary to perform the work of a Third or Second Class Petty Officer in a specific rating.

Class C schools teach particular skills or techniques which are not necessarily related to a particular rating. For example, Motion Picture Operating School is a Class C school open to a number of ratings.

Class P schools provide preparatory training for a broad field such as aviation or electricity combined with electronics.

Functional schools provide training in the performance of special tasks or functions such as fire fighting, salvage and explosive ordnance disposal.

Fleet schools provide training in matters related to the air, surface and sub-surface operational training of the Fleet. Some examples of these schools are Sonar School, Gunnery School and Antisubmarine Warfare School.

Factory schools, some of which are located at civilian industrial plants, provide training, not covered in regular Navy schools, on specific types of equipment.

## Navy Education Programs

Sailors can continue their formal education while on active duty. During cruises at sea, it is very difficult for sailors to find the time and space to do school work, but some sailors manage to do so. When sailors are stationed ashore, they have more opportunity to attend schools and colleges during their off-duty hours. In addition, because the Navy recognizes that education can help sailors to do their work, as well as to advance in rate, the Navy has been authorized by the Congress and the President to pay for some or all of the costs of sailors' education.

Navy education programs can be classified as those which: (a) increase the educational level of enlisted personnel; (b) prepare and qualify personnel for officer commissions; and (c) increase the educational level of officer personnel.

Management of Navy education programs is carried out through a management system called The Navy Campus for Achievement (NCFA). NCFA helps Navy student's to realize educational goals through enrollment in civilian institutions and through participation in Navy educational programs.

The following programs are designed, in general, to increase the educational level of enlisted personnel:

- Program for Afloat College Education (PACE)
  PACE is a program that is conducted on those Navy ships whose Commanding Officers feel that the program is both desirable to the crew and workable within the operating schedule of the ship. College teachers, hired by the Navy, teach regular college subjects both aboard ship and in classroom's at the ship's home port. These courses are fully accredited and can be applied to the total required for an associate or bachelor's degree.

- Servicemen's Opportunity College (SOC)

  SOC is not a tuition assistance program. Instead, this program focuses on helping sailors, who must move around, satisfy the graduation requirements of a single school. A number of colleges, community colleges, universities, and technical schools have agreed to accept the credits of each other without requiring a sailor to earn a majority of degree credits at any one instituation. In addition, these same schools will award college credit for some of the Navy training courses that a sailor may already have completed.

- Predischarge Education Program (PREP)

  PREP helps Navymen and women, who lack a high school diploma, to continue their education after discharge and to prepare themselves for higher education or vocational training.

- Defense Activity for Non-Traditional Education Support (DANTES)

  The DANTES program, open to all members of the Armed Services, provides the means to obtain a high school diploma through the General Educational Development (GED) test program. It also provides the means to obtain college credit through examination programs and, in the future, will provide the services necessary for personnel to qualify for vocational and occupational licenses and certifications.

The following programs are designed to prepare and qualify personnel for officer commissions:

- Broadened Opportunity for Officer Selection Training Program (BOOST)

  The BOOST program is designed to assist sailors who have leadership potential and the aptitude to get ahead, but who have had inadequate academic preparation to compete successfully for officer training programs. Through a six month to two year program, participants build up their scholastic abilities and prepare to compete for admission to the Naval Academy or other naval officer programs.

- Naval Reserve Officers Training Corps (NROTC)

  NROTC programs are conducted at 58 civilian colleges and universities, including Oregon State University. These are full or partial scholarship programs which combine studies for a bachelor's degree with naval officer training courses. On graduating, participants receive officer commissions and perform active duty in the Navy. Applicants must be between the ages of 17 and 21 to apply. Selection is based on the results of the college entrance exams, a medical examination, and personal interviews.

- United States Naval Academy

  The U.S. Naval Academy provides military training for future Navy and Marine Corps officers as well as degree programs in twenty-six major fields. Applicants between the ages of 17 and 21 compete for Presidential or Congressional appointments to the Academy. Navy enlisted personnel may compete for these appointments. In addition, the Secretary of the Navy appoints 170 enlisted personnel to the Naval Academy each year. Enlisted personnel may compete for these appointments also.

- Navy Enlisted Scientific Education Program (NESEP) NESEP offers qualified Navymen and women up to four years of college education in any of 18 major fields of science. Tuition costs are fully covered and petty officers selected for NESEP receive full pay, allowances and benefits while attending one of 22 civilian colleges or universities connected with the program. Eligibility rules are rigid, however, and personnel must receive strong recommendations from their commanding officers. Graduates receive officer commissions and serve for a minimum of five years.
- Navy Enlisted Nursing Education Program (NENEP) NENEP is a four year nursing scholarship program open to men and women petty officer Hospital Corpsmen and Dental Technicians. Selectees must be high school graduates accepted at an accredited school of nursing. Upon graduation, they are commissioned as Ensigns in the Nurse Corps.

- Navy Enlisted Dietetic Education Program (NEDEP) NEDEP offers qualified men and women up to three years of college, a bachelor's degree in medical dietetics and a commission in the Medical Service Corps. To be eligible for this program Navy personnel must be under 26 years old, must have served on active duty for at least one year, and must have completed at least 32 semester hours in college.

The following programs are designed, in general, to increase the educational level of officer personnel:

- Naval Postgraduate School
  The Naval Postgraduate School at Monterey, California, is a fully accredited institution with ten academic departments. The school awards degrees in 23 major fields and is open to commissioned officers of all branches of the Armed Services.
- Navy War College
  The Navy War College at Newport, Rhode Island, provides courses in principles of tactics, strategy and decision-making for junior and senior commissioned officers from all branches of the Armed Services and for allied officers.
- National War College
  The National War College, located in Washington, D. C., offers a ten-month program designed to prepare more senior officers from all branches of the Armed Services for positions of greater responsibility. Among other courses, students study national security policy, military strategy and world-wide issues.
- Armed Forces Staff College
  The Armed Forces Staff College in Norfolk, Virginia, provides two five-month courses each year for officers from all branches of the Armed Services. The courses are designed to prepare officers for duty on staffs, for defense management positions and for important troop and fleet commands.

There is one other program which provides educational opportunities for both officers and enlisted personnel:

- Navy Tuition Assistance Program
  The Navy will pay up to 75 percent of tuition costs for qualified Navymen and women taking courses for credit at civilian schools during off-duty time.

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Advancement in the Navy

Sailors in all ratings advance in rate by continually learning about and working in their occupations. Advancements are determined by: (1) the length of time a sailor has spent in the Navy; (2) the length of time he has spent in his present rate; (3) the quality of his or her work as reflected in his or her supervisor's performance evaluations; (4) examination scores; and (5) any special awards and commendations he or she may have received. Points are awarded for each of these items, and these points are combined to arrive at a total score. After each examination, the Navy determines the minimum score sailors must have in order to be advanced. Advancement to pay grades E-8 and E-9 are determined by selection boards.

The length of time it takes for an individual to advance depends to some extent on the individual, so it is not possible to predict exactly when promotions will occur. Some estimates of when promotions are likely to occur can be made.

During recruit training, a sailor is called a "recruit" and earns pay at the level of pay grade E-1. After recruit training, sailors become "apprentices" and earn at the level of pay grade E-2. As is true of apprenticeships in other work environments, Navy apprenticeships consist primarily of formal schooling or "learning through helping" the more experienced sailors. At this "helping" stage, new sailors perform the cleaning, carrying, and other tasks that older sailors would otherwise have to do. At the same time, these apprentices are learning how experienced sailors perform work correctly and efficiently.

After about 10 months with the Navy, sailors advance to the next pay grade, E-3. Depending on the field that the sailor is working in, he or she is classified as one of the following: Seaman, Fireman, Construction Man, Airman, Hospitalman, Dentalman, or Stewardsmen. At this stage, the sailor gradually takes more and more of the work tasks of the experienced sailors. If the sailor demonstrates that he is learning the skills of a specific Navy occupation, or if he has graduated from a basic Navy trade school, or if he has passed an examination for E-4 but has not been advanced because his total score has been below the minimum required for advancement, he can be designated a "striker".

This means that the sailor is considered to have the basic occupational skills required of a Petty Officer, Third Class, in his trade, but has not achieved a high enough score to be officially "rated" as a Petty Officer, Third Class.

About 16 months after entering the Navy, sailors who have worked hard and learned their sills advance to Petty Officer, Third Class and earn at the level of pay grade E-4. This promotion also means that the sailor has earned a "rating" in a specific occupation. This "rating" indicates the type of work for which the sailor is qualified and which he can be expected to perform.

Sailors usually advance to the next level, Petty Officer, Second Class, after about four year in the Navy. Sailors of this rate earn pay at pay grade E-5. At this level, sailors are expected to perform more difficult tasks in their occupations and, at times, are assigned leadership and supervisory duties.

Sailors who decide to work for the Navy for an extended period normally advance to Petty Officer, First Class, after about eight years of service. These sailors earn pay at pay grade E-6. They are responsible for performing the more difficult tasks in their occupations. At this stage, they are often assigned to supervise and train less experienced personnel.

Twelve to 14 years after entering the Navy, sailors may qualify to become Chief Petty Officers, who earn pay at the E-7 level. Chief Petty Officers assume major roles as leaders, responsible for the morale and productivity of the personnel they supervise, and they have increased responsibilities for instructing and training personnel assigned to them.

Chief Petty Officers of outstanding ability may advance to the rate of Senior Chief Petty Officer and earn pay at the E-8 level. This advancement usually takes place after about 18 years in the Navy. Chief Petty Officers who have advanced this far design and carry out training programs for sailors in their occupational field as well as plan and supervise routine work. On occasion, they work outside their specialty in positions of general leadership, administration, and supervision.

Senior Chief Petty Officers of exceptional ability may advance, usually after about 22 years in the Navy, to the rate of Master Chief Petty Officer and earn pay at the E-9 level. Master Chief Petty Officers supervise and administer the activities of personnel in their own and other ratings within a command. They may also function outside of their specialty as senior enlisted advisors to the commanding officer in matters concerning enlisted personnel.

Navy men and women officers are promoted by selection boards who meet annually to review the qualifications of those officers eligible for promotion. Eligibility for promotion is determined by the total number of years of commissioned service for all men and women officers, except Warrant Officers. Warrant Officers eligibility is determined by the number of years in rank.

Ensigns are eligible for promotion to Lieutenant-junior grade after two years of commissioned service; to Lieutenant after four years of commissioned service; to Lieutenant Commander after 9-10 years; to Commander after 15-16 years; and to Captain after 21-22 years. (Note: The rank of Commander is the highest rank available to Limited Duty Officers.) Officers of unusually high caliber are later selected for flag rank, i.e., the rank of Rear Admiral. A Warrant Officer (WO-1) must serve two years before being eligible for promotion to Chief Warrant Officer (CWO-2). There are two additional steps for Chief Warrant Officers (CWO-2)—CWO-3 and CWO-4. To be eligible for CWO-3, an officer must serve four years as a CWO-2 and to be eligible for CWO-4, an officer must serve four years as a CWO-3.

Officers who meet the eligibility requirements are screened by the selection boards. The boards review the officers' evaluations (called "fitness reports") and recommend those qualified for promotion. The board's recommendations are reviewed by the Secretary of the Navy who in turn submits the list of recommendations to the U.S. Senate for approval.

Exceptional officers may be promoted ahead of their contemporaries and some officers, though eligible, are not recommended for promotion. Officers not recommended for promotion are considered again in the following year.

# II. NAVY "RATINGS" OR OCCUPATIONS

# AEROGRAPHER'S MATE *

## NATURE OF THE JOB

The Navy has its own weather forecasters, called Aerographer's Mates. These personnel are trained in the science of meteorology and the use of aerological instruments that monitor the various characteristics of weather such as air pressure, temperature, humidity, wind speed and wind direction. Aerographer's Mates collect, analyze, and distribute up-to-date weather information to Navy aircraft, ships, and shore facilities.

Aerographer's Mates prepare weather maps and forecasts. They analyze atmospheric conditions to pick out the best flight levels for aircraft. They measure wind and air density to increase the accuracy of antiaircraft firing, shore bombardment and delivery of weapons from aircraft.

Aerographer's Mates are responsible for testing, regulating, and caring for the instruments they use. One of their jobs is preparing instruments for balloon flight to collect data about conditions of the upper atmosphere. The daily work of Aerographer's Mates calls for typing, and they must know how to maintain typewriters as well as weather instruments.

Administrative duties include ordering and inventoring equipment and supplies, maintaining files of weather data and preparing summaries and reports for distribution and for briefings. They also keep technical manuals (which describe weather forecasting techniques) up to date by adding or changing information.

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* Each Aerographer's Mate is involved in some of the general work of the Navy as well as the work of his or her own "rating" or occupation. It is very important for each sailor to understand the general work of the Navy as well as the work of his or her own rating. The first chapter of this manual describes the general work of the Navy.

## WORKING CONDITIONS

Aerographer's Mates are assigned to large ships such as aircraft carriers and cruisers at sea. Ashore, they are assigned to naval air stations and to Navy weather centers in the United States and overseas.

### Sea-Shore Rotation

Aerographer's Mates spend approximately 10-12 years on "sea duty" during a 20-year period in the Navy. "Sea Duty" includes all of the time during which a sailor is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home.

The remaining 8-10 years of a 20-year period in the Navy will be spent on "shore duty," duty at permanent shore locations where the Aerographer's Mate will provide support for fleet units.

Since Navy women do not serve aboard combatant ships, women in this rating generally work at shore facilities in the United States and overseas.

## QUALIFICATIONS

Aerographer's Mates must have good general learning ability. Candidates must pass the Navy Arithmetic Test, which measures ability to use numbers in solving practical problems. Previous courses in algebra, trigonometry, physics and typing are helpful, but not essential. Training or experience in meteorology, astronomy, and the physical sciences also are most useful, but are not required to qualify for Aerographer's Mate.

## TRAINING PROVIDED BY THE NAVY

The Navy has an Aerographer's Mate school where it trains candidates for this job. Candidates not selected for the school may receive training on the job and through individual study of Navy Correspondence Courses. The Aerographer's Mate school gives training in:

- Principles of meteorology—structure of the atmosphere including effects of heat and moisture; weather elements; air masses and circulation of air currents and winds; structure of cyclonic storms; general conditions over different regions of the earth and over different ocean areas.
- Principles of physics that apply to meteorology such as laws of motion, nature of gases, sound, optics, energy and electrostatics.

- Principles of arithmetic, algebra, trigonometric functions, logarithms and graphs; use of the slide rule.
- Use of mathematical and aerological tables and adiabatic charts (charts of thermal changes within air masses).
- Use of special instruments to detect and measure atmospheric conditions; procedures for calibrating and maintaining instruments and for making reading corrections.
- Common symbols used on weather charts, weather codes, methods of interpreting weather observations and reports, methods of plotting weather charts and other means of recording weather data.
- Teletypewriting and typewriting; procedures for cleaning, maintaining and adjusting typewriters.

## EMPLOYMENT OPPORTUNITY

There are approximately 1,800 men and women performing work in the Aerographer's Mate rating, of whom about 1,200 are rated petty officers. Opportunities exist for qualified applicants.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

The Sailor's Rank and Occupation Page 4
The General Work of the Navy Page 23
Shipboard Routine in the Navy Page 27
Shipboard Life Page 28
Lengths of Cruises and Time Between Cruises Page 30
"Shore Duty"—Work at Navy Shore Facilities Page 32
Rotation Between "Sea Duty" and "Shore Duty" Page 33
How the Navy Hires Page 35
Navy Pay Page 40
Navy Retirement Benefits Page 43
Navy Training and Education Page 44
Advancement in the Navy Page 51

# AIR CONTROLMAN *

## NATURE OF THE JOB

The work of Navy Air Controlmen is like the work of civilian airport control tower operators. Air Controlmen are responsible for the safe, orderly, and speedy movement of aircraft into and out of landing areas. They also control the movement of aircraft on the taxiways and issue flight clearances to pilots by radio. In the Navy, however, the landing area may be the deck of an aircraft carrier as well as an airfield.

Air Controlmen identify both military and commercial aircraft, and track and record aircraft positions. Controlmen direct traffic by means of radio, radar and flashing light signals. Field lighting systems, as well as signal lights, are operated by Air Controlmen.

Air Controlmen communicate with aircraft by voice radio, providing information about traffic, weather conditions, and other information needed for aircraft navigation. They use radarto help lost aircraft get back on course and to provide heading (direction) and altitude information to aircraft as they approach a runway for landing. They also use radar to search for, challenge, track and intercept aircraft.

Air Controlmen use aeronautical charts and maps as well as instruments in their work. They are responsible for maintaining these charts and maps and for correcting them based on data from other sources.

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* Each Air Controlman is involved in the general work of the Navy as well as in the work of his or her own "rating" or occupation. It is very important for each sailor to understand the general work of the Navy as well as the work of his or her own rating. The first chapter of this manual describes the general work of the Navy.

## WORKING CONDITIONS

Air Controlmen may be assigned to airfields or to aircraft carriers. They may work in a control tower, from which traffic is directed; or they may work in an operations office, where flight plans are coordinated, aircraft positions are recorded, and information is gathered on weather, air traffic en route, and other factors related to navigation.

### Sea-Shore Rotation

Air Controlmen spend approximately 6-8 years on "sea duty" during a 20-year period in the Navy. "Sea duty" includes all of the time during which a sailor is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home.

The remaining 12-14 years of a 20-year period in the Navy will be spent on "shore duty," duty at permanent shore locations where the Air Controlman will provide support for fleet units.

Since Navy women do not serve aboard combatant ships, women in this rating generally work at shore facilities in the United States and overseas.

## QUALIFICATIONS

Air Controlmen must have good general learning ability, an aptitude for mathematics, and precise, accurate work habits. They must be self-reliant and able to stay calm under stress. The physical requirements include excellent vision and a clear, well-modulated speaking voice.

There are no requirements for previous training or experience. Courses or experience in public speaking and broadcasting are helpful.

## TRAINING PROVIDED BY THE NAVY

Candidates for this job are tained at the Air Controlman school. Training covers:

- Airport and airway regulations, including the regulations of the Federal Aviation Agency governing standard airport traffic control procedures
- Emergency procedures to be followed in case of instrument approach emergencies, crashes and fires

- Weather observation; weather sequence reports; minimum weather conditions for visual landings, instrument landings, and for airport closing; procedures used in broadcasting weather reports
- Use of publications to augment and correct aeronautical sharts; principles used in dead-reckoning navigation (navigation through use of such data as the direction the plane is headed, speed of plane, wind drift, and time elapsed); principles of instrument flying and of radio and radar aids; procedures for plotting ranges; and positions of aircraft
- Principles of operation, types, capabilities, and limitations of radar; use of radar for assisting lost aircraft, for controlling approaches, and for tracking, searching, challenging, and intercepting aircraft
- Principles and procedures for using radio, flag hoists and flashing lights when communicating with aircraft
- International Morse Code
- Tactics, capabilities and characteristics of aircraft as they affect flight control procedures.

## EMPLOYMENT OPPORTUNITY

There are approximately 2,800 men and women performing work in the Air Controlman rating, of whom about 2,200 are rated petty officers. Opportunities are limited except for highly qualified applicants.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

| | |
|---|---|
| The Sailor's Rank and Occupation | Page 4 |
| The General Work of the Navy | Page 23 |
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## AIRCREW SURVIVAL EQUIPMENTMAN *

### NATURE OF THE JOB

Aircrew Survival Equipmentmen are responsible for keeping parachutes and other aviation survival gear in proper working condition. The primary tasks of these personnel are to prepare and pack parachutes for flight and to perform maintenance work on parachutes. They also take care of flight clothing and other types of survival equipment such as rubber life rafts, life jackets, oxygen breathing apparatus, protective clothing and air-sea rescue equipment.

In their work with parachutes, Aircrew Survival Equipmentmen do such things as:

- Install fasteners
- Manufacture small parts for all kinds of parachutes and make lift webbing and slings for use with cargo parachutes and cargoes to be dropped
- Clean stained parachute fabrics
- Make alterations and major repairs
- Rig, load, and drop dummies to test parachutes
- Pack parachutes for flight
- Issue, and keep records on parachutes.

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* Each Aircrew Survival Equipmentman is involved in the general work of the Navy as well as in the work of his or her own "rating" or occupation. It is very important for each sailor to understand the general work of the Navy as well as the work of his or her own rating. The first chapter of this manual describes the general work of the Navy.

Similar tasks of inspection, testing, manufacturing small parts, cleaning, repairing and packing are done by Aircrew Survival Equipmentmen to keep other types of survival equipment in good order.

Aircrew Survival Equipmentmen must know procedures for jumping and how to use survival equipment. They must know types, sizes, styles, properties, and uses of the materials they use in their work—for example: slide feateners, needles, threads, webbing, leather, pure and synthetic rubber, rubber cement, and various fabrics such as cotton, silk, rayon and nylon. They also must know how to service and repair sewing machines, which they use a great deal in their work.

Administrative duties include ordering parts, tools and other work materials. Tools and equipment are inventoried periodically and records maintained. Records are also kept on required inspections of survival equipment, including equipment in the aircraft and equipment worn by air crew members. In addition, each shop has a set of technical manuals which describe the theory, testing, operation and repair of parachutes and other survival equipment. Aircrew Survival Equipmentmen keep the manuals up to date by adding or changing information, and they recommend changes to procedures in the manuals based on their experience in testing and repairing the equipment.

## WORKING CONDITIONS

This is primarily an indoor job in a shop-type setting. Aircrew Survival Equipmentmen work on aircraft carriers or at naval air facilities ashore.

### Sea-Shore Rotation

Aircrew Survival Equipmentmen spend approximately 8-10 years on "sea duty" during a 20-year period in the Navy. "Sea duty" includes all of the time during which a sailor is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spend in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home.

The remaining 10-12 years of a 20-year period in the Navy will be spent on "shore duty, " duty at permanent shore locations where the Aircrew Survival Equipmentman will provide support for fleet units.

Since Navy women do not serve aboard combatant ships, women in this rating generally work at shore facilities in the United States and overseas.

## QUALIFICATIONS

Candidates must be able to perform extremely careful, accurate work, since they are responsible for equipment that may be needed to save someone's life. Average or above average learning ability is required, along with mechanical aptitude. Previous training and experience in general shop, machine sewing, and sewing machine repair are helpful, but are not required.

## TRAINING PROVIDED BY THE NAVY

Aircrew Survival Equipmentmen attend school for training. Subjects include:

- Parachutes: parts, materials, construction, care in handling, packing, storing, operation, cleaning, and repair
- Properties of fabrics and other materials
- Use, maintenance, and repair of sewing machines, plus types of seams and stitching
- Survival equipment packing, storing, testing, and servicing
- Oxygen and carbon dioxide characteristics
- Parachute jumping.

## EMPLOYMENT OPPORTUNITY

There are approximately 750 men and women performing work in the Aircrew Survival Equipmentman rating, of whom about 350 are rated petty officers. Opportunities are good for qualified applicants.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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## AVIATION ANTISUBMARINE WARFARE OPERATOR *

### NATURE OF THE JOB

The Navy's antisubmarine warfare effort relies on naval aviation as well as surface ships and submarine forces. Aviation Antisubmarine Warfare Operators operate airborne radar and electronic equipment used in detecting, locating, and tracking submarines. They also operate radars to provide information for aircraft navigation and for surface navigation (navigation of ships on the surface of the water). These personnel may also act as helicopter rescue crewmen. They work as part of the flight crew on long-range patrol aircraft, intermediate range aircraft and on helicopters.

In flight, Aviation Antisubmarine Warfare Operators use highly sophisticated equipment for detecting submerged submarines through acoustic (sound) signals, electronic emissions and magnetic indicators. When not flying, the operators analyze data returned from flights, continue their training and serve as training instructors.

Administrative duties include maintaining equipment performance records and adding or changing information in the technical manuals which describe the operation of the radars and other electronic equipment.

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* Each Aviation Antisubmarine Warfare Operator is involved in the general work of the Navy as well as the work of his own "rating" or occupation. It is very important for each sailor to understand the general work of the Navy as well as the work of his own rating. The first chapter of this manual describes the general work of the Navy.

## WORKING CONDITIONS

Aviation Antisubmarine Warfare Operators are assigned to aviation squadrons as members of aircraft flight crews. They work at naval air stations in the United States and overseas and on board aircraft carriers.

### Sea-Shore Rotation

Aviation Antisubmarine Warfare Operators spend approximately 8-10 years on "sea duty" during a 20-year period in the Navy. "Sea duty" includes all of the time during which a sailor is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home.

The remaining 10-12 years of a 20-year period in the Navy will be spent on "shore duty," duty at permanent shore locations where the Aviation Antisubmarine Warfare Operator will provide support for fleet units.

## QUALIFICATIONS

Candidates must have above average learning ability, knowledge of arithmetic, and a high degree of electrical and mechanical aptitude. The physical requirements are vision correctiable to 20/20, normal ability to recognize color, normal hearing and speech, and good physical condition to pass the flight physical examination. Candidates also must be able to swim. Courses in algebra, trigonometry, physics, electricity, radio and mechanics are helpful but are not essential.

## TRAINING PROVIDED BY THE NAVY

Aviation Antisubmarine Warfare Operators attend school to learn the fundamentals of their rating. They are then assigned to particular types of aircraft and receive 12 to 19 weeks of specialized training for their assignments. Aviation Antisubmarine Warfare Operators continue to receive training throughout their careers to keep their skills up-to-date.

Training includes such subjects as:

- Physics of sound
- Physical properties of water
- Effects of physical and temperature boundaries on underwater sound
- Use and application of basic electrical laws
- Principles of mathematics relating to the equipment used

- Use of hand tools and electrical measuring equipment
- Fundamentals of flight and navigation
- Safety precautions in electrical and electronic occupations.

## EMPLOYMENT OPPORTUNITY

There are approximately 2,400 personnel performing work in the Aviation Antisubmarine Warfare Operator rating, of whom about 1,800 are rated petty officers. Opportunities are excellent for qualified applicants.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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## AVIATION ANTISUBMARINE WARFARE TECHNICIAN *

### NATURE OF THE JOB

Aviation Antisubmarine Warfare Technicians are electronic technicians responsible for keeping antisubmarine warfare (ASW) systems and equipment in good operating condition. In addition, they are involved in safety instruction related to aviation electronic equipment and facilities, and they perform a number of administrative duties.

Aviation ASW Technicians inspect ASW equipment in aircraft daily for secure mounting and evidence of damage; they also perform a special inspection before each flight. They install and remove equipment in aircraft. They test for short circuits, grounds, broken cables and pressure leaks. They clean parts, identify and replace defective parts, adjust and align parts, and evaluate the performance of overhauled or newly installed equipment. They receive reports from crew members on equipment operation during flight; they evaluate discrepancies between how the equipment should have worked and how it actually worked, and they make recommendations for correcting problems. As engineers design changes to ASW equipment, technicians receive instructions and then make sure that the equipment in their aircraft is changed. A typical change might require inserting a larger resistor in a circuit.

Aviation Antisubmarine Warfare Technicians use a variety of test devices in checking out electronic ASW equipment. For example, they use devices to measure voltage, current and resistance; and they use signal

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* Each Aviation Antisubmarine Warfare Technician is involved in the general work of the Navy as well as in the work of his or her own "rating" or occupation. It is very important for each sailor to understand the general work of the Navy as well as the work of his or her own rating. The first chapter of this manual describes the general work of the Navy.

generators and oscilloscopes. The technician is responsible for selecting test equipment and for deciding on the most appropriate test equipment to use for particular testing purposes. The technicians also maintain and make minor repairs on the test equipment.

Their work involves careful attention to safety. Aviation ASW Technicians inspect work areas, tools, and equipment for hazards. They read general safety instructions, identify those relevant to electronic work, and establish appropriate procedures and standards. Aviation ASW Technicians also plan and conduct safety instruction programs for those who work with aviation electronic equipment.

Administrative duties include ordering parts, tools and other working materials. Aviation ASW Technicians also keep records on who has various equipment and materials and they take inventory periodically. Technicians maintain other records on ASW systems—histories of how they work, repairs made, etc., and current status. In addition, each shop has a set of technical manuals which describe the theory, testing, operation and repair of ASW equipment in detail. Aviation Antisubmarine Warfare Technicians keep the manuals up to date by adding or changing information, and they recommend changes to procedures in the manuals based on their experience in testing and repairing the equipment.

## WORKING CONDITIONS

These personnel do their work in an electronic shop setting or on the aircraft itself. They may work aboard aircraft carriers, at naval air stations, or at any other place where antisubmarine warfare aircraft may be assigned. Some of the work is performed out of doors in weather good or bad, and often there is a high level of noise in the vicinity.

When working on a flight line or on the flight deck of a carrier, in addition to high noise levels, there are the additional hazards of jet engine suction, jet exhaust, spinning propellers and moving aircraft.

### Sea-Shore Rotation

Aviation Antisubmarine Warfare Technicians spend approximately 8-10 years on "sea duty" during a 20-year period in the Navy. "Sea duty" includes all of the time during which a sailor is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases or at naval air stations. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home.

The remaining 10-12 years of a 20-year period of service will be spent on "shore duty," duty at permanent shore locations where the Aviation Antisubmarine Warfare Technician will provide support for fleet units.

Since Navy women do not serve aboard combatant ships, women in this rating generally work at shore facilities in the United States and overseas.

## QUALIFICATIONS

Aviation Antisubmarine Warfare Technicians must have above average math ability and a high aptitude for electrical and mechanical work. They must have normal color vision and very good hearing. Candidates must be able to get a security clearance.

It is helpful to have taken courses in algebra, trigonometry, physics, electricity, and mechanics but previous courses in these subjects are not required. It is helpful, but not required, to have previous experience in electrical and electronic trades.

## TRAINING PROVIDED BY THE NAVY

The first step in training for this job, after recruit training, is to attend Avionics Fundamentals school. Qualified graduates of recruit training study basic electricity and electronics; then they study maintenance of antisubmarine warfare electronic equipment. Finally, they attend a Fleet Sonar School where they are tained as equipment operators. It is possible to qualify for this specialized training through on-the-job experience and individual study of Navy correspondence courses.

The following list gives examples of some of the specific things Aviation Antisubmarine Warfare Technicians learn in the Navy:

- Meanings of electrical and electronic terms and units of measure
- Identification and marking systems for cable, wire, and connectors
- Functions and characteristics of electronic circuit parts
- Principles of electron tubes, semiconductors, and transistors
- Principles of alternating and direct current and of amplitude and frequency modulation
- Physics of heat, light, sound, fluids, and gases
- Principles of magnetism, electromagnetic induction, transformers, motors and generators; principles and applications of heterodyning and of synchro and servo systems; principles of detectors, amplifiers, oscillators, phase inverters and cathode followers

- Operating principles of direction-and attitude-sending elements including gyros, compasses, and accelerometers
- Types and characteristics of computer elements used to solve mathematical problems
- Safety programs for aviation electronic equipment and facilities
- Preventive maintenance of aircraft electronic equipment
- Troubleshooting aircraft electronic equipment
- Testing and repairing related equipment.

## EMPLOYMENT OPPORTUNITY

There are approximately 1,100 men and women performing work in the Aviation Antisubmarine Warfare Technician rating of whom about 900 are rated petty officers. There is a shortage of qualified applicants and opportunities are excellent for qualified personnel.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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# AVIATION BOATSWAIN'S MATE*

## NATURE OF THE JOB

Aviation Boatswain's Mates perform very critical work, much of which is unique to Naval Aviation. They work on the flight decks and hangar bays of aircraft carriers and perform vital roles in aircraft launching (taking-off by catapult) and recovery (landing by snagging a wire on the flight deck with a hook on the aircraft) operations.

Aviation Boatswain's Mates direct the movement of aircraft on the flight deck and in the hangar bays prior to launch and after recovery. They use tow tractors to position aircraft; they operate support equipment used to start aircraft; and they direct the pilots as they taxi their aircraft to the catapults for launching and away from the wires after landing. On the catapults, Aviation Boatswain's Mates ensure that the aircraft are positioned properly and that all cables and attachments are in the proper position. This often involves crawling underneath aircraft whose engines are turning at a high rate. They also fire the catapults on signal. Aviation Boatswain's Mates ensure that the aircraft hook is free of the wires after landing; direct the pilot to the proper position; and then supervise the fastening of the aircraft to the flight deck with chains. In the hangar bays, Aviation Boatswain's Mates again direct the movement and fastening of aircraft and operate the large elevators which move the aircraft up and down between the flight deck and the hangar bays. They are also responsible for maintaining and repairing the catapult and landing (called "arresting gear) equipment.

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Aviation Boatswain's Mates fuel and defuel planes and maintain the systems used to transfer fuel and lubricating oil between storage and the aircraft. They check for leaks in tanks and lines, and keep them free of gasoline fumes by filling them with nitrogen or carbon dioxide. They load and unload aviation gasoline and lubricating oil supplies from tankers and other ships.

Aviation Boatswain's Mates also supervise the loading and unloading of aircraft and cargo and have aircraft salvage duties as well. They perform crash fire fighting duties and maintain crash fire fighting and rescue equipment.

When ashore, Aviation Boatswain's Mates are assigned to naval air stations where they again direct aircraft servicing and handling; maintain field emergency equipment; and, in some cases, perform as members of crash and fire fighting crews. They may also be assigned to air training squadrons where they will supervise and perform flight line duties.

## WORKING CONDITIONS

Aviation Boatswain's Mates are assigned to aircraft carriers and to naval air stations in the United States and overseas. Their work is physically demanding and is performed out of doors in all kinds of weather. Hazardous conditions are common and include hazards due to high noise levels, jet suction, jet exhaust and moving aircraft.

### Sea-Shore Rotation

Aviation Boatswain's Mates spend approximately 10-12 years on "sea duty" during a 20-year period in the Navy. "Sea duty" includes all of the time during which a sailor is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spend in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home.

The remaining 8-10 years of a 20-year period in the Navy will be spent on "shore duty," duty at permanent shore locations where the Aviation Boatswain's Mate will provide support for fleet units.

Since Navy women do not serve aboard combatant ships, women in this rating generally work at shore facilities in the United States and overseas.

## QUALIFICATIONS

Aviation Boatswain's Mates need 20/30 vision uncorrected, normal ability to perceive color, and good hearing. They need average or above average general learning ability and good mechanical aptitude (candidates must pass the Navy Mechanical Aptitude Test). Applicants should understand and be prepared to accept the hazardous conditions frequently encountered in this rating.

School courses in shop work, physics, and chemistry are helpful, but are not required. Experience in handling planes and hoisting equipment also is helpful but not required.

## TRAINING PROVIDED BY THE NAVY

Training is provided at Aviation Boatswain's Mate Class A school. Candidates are selected to attend this school after recruit training. Aviation personnel who are not initially selected for the school may receive training on the job and through individual study of Navy correspondence courses. These personnel may be selected to attend the Class A school later.

Training for the job of Aviation Boatswain's Mate covers:

- Basic training in aircraft systems including fundamentals of hydraulics, physics, electricity and mechanics
- Methods for handling and towing planes aboard ship and at naval shore facilities on land; hand, whistle, voice, and light signals for towing, taxiing, hoisting, and catapulting planes
- Common knots and splices; wire rope splicing and socketing
- Flight deck procedures; names, operation and maintenance of arresting gear, barricades, catapults, airplane cranes and winches; names of deck equipment, lines, and cables
- Fuel handling, including procedures for refueling at sea
- Crash fire fighting and rescue procedures.

## EMPLOYMENT OPPORTUNITY

There are approximately 4,600 men and women performing work in the Aviation Boatswain's Mate rating, of whom about 3,300 are rated petty officers. Shortages exist and opportunities are excellent for qualified applicants.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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# AVIATION ELECTRICIAN'S MATE *

## NATURE OF THE JOB

Aviation Electrician's Mates are aircraft electricians. They maintain the operating efficiency of a wide range of electrical equipment in aircraft, including power generators and converters, lighting systems, flight instrument systems, flight control systems, fuel quantity indicating systems and temperature and pressure indicating systems.

Aviation Electrician's Mates install test, diagnose, calibrate, remove, replace, and repair instruments such as temperature and pressure indicators, fuel quantity indicators, compasses, tachometers, and position indicators for landing gear and wing flaps. They work on such equipment as generators, motors, voltage regulators, transformers, and ignition system components. They analyze and repair lighting and power circuits. They install and test batteries for specific gravity and electrolyte level; maintain battery water level; and charge batteries.

These personnel must be able to read electrical system blueprints. They use a variety of measuring instruments—for example, galvanometers, ammeters, and voltmeters. They use electrician's hand tools and soldering equipment, and machine tools such as lathe and grinding equipment.

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* Each Aviation Electrician's Mate is involved in the general work of the Navy as well as in the work of his or her own "rating" or occupation. It is very important for each sailor to understand the general work of the Navy as well as the work of his or her own rating. The first chapter of this manual describes the general work of the Navy.

Administrative duties include ordering parts, tools and other working materials. Tools and equipment are inventoried periodically and records maintained. Aviation Electrician's Mates also maintain records on aircraft electrical systems—histories of their performance, repairs made and current status. In addition, each shop has a set of technical manuals which describe the theory, testing, operation and repair of electrical systems in detail. Aviation Electrician's Mates keep the manuals up to date by adding or changing information, and they recommend changes to procedures in the manuals based on their experience in testing and repairing the equipment.

## WORKING CONDITIONS

Aviation Electrician's Mates typically work on the aircraft or in an electrical shop setting aboard aircrfat carriers, at naval air stations ashore, or at any other place where Navy aircraft may be based. Much of their work is done out of doors in weather good or bad, and often there is a high noise level in the vicinity. When working on a flight line or on the flight deck of a carrier, in addition to high noise levels, there are the additional hazards of jet engine suction, jet exhaust, spinning propellers and moving aircraft.

### Sea-Shore Rotation

Aviation Electrician's Mates spend approximately 8-10 years on "sea duty" during a 20-year period in the Navy. "Sea duty" includes all of the time during which a sailor is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home.

The ramaining 10-12 years of a 20-year period in the Navy will be spent on "shore duty," duty at permanent shore locations where the Aviation Electrician's Mate will provide support for fleet units.

Since Navy women do not serve aboard combatant ships, women in this rating generally work at shore facilities in the United States and overseas.

## QUALIFICATIONS

Candidates must have average or above average general learning ability and an aptitude for math (they must pass the Navy Arithmetic Test to qualify). They must have a high degree of aptitude for electrical work and be able to work safely with potentially hazardous equipment and materials.

There are no requirements for previous training or experience. However, experience in aircraft or automotive electrical work is very valuable, and courses in algebra, trigonometry, physics, and electrical shop are helpful.

## TRAINING PROVIDED BY THE NAVY

Training for the job of Aviation Electrician's Mate is provided in a Navy school. Candidates are selected for the school after recruit training. Those who are not selected for the school initially may receive training on the job and through Navy correspondence courses, and may be selected to attend the Aviation Electrician's Mate school at a later time.

Training for this job includes:

- Basic electricity
- How to use mathematics in solving electrical problems
- Symbols used in wiring diagrams and blueprints
- Basic motor, regulator, generator, and voltage regulator technology; basics of alternating and direct current in aircraft electrical systems
- Types, uses, operation and calibration of aircraft mechanical, electrical, vacuum, and gyro instruments
- How to maintain electrical equipment including use of corrosion preventives and lubricants
- Safety and first-aid techniques for use around electrical equipment.

## EMPLOYMENT OPPORTUNITY

There are approximately 7,000 men and women performing work in the Aviation Electrician's Mate rating, of whom about 5,600 are rated petty officers. Shortages exist and opportunities are excellent for qualified applicants.

## ADDITIONAL INFORMATION

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## AVIATION ELECTRONICS TECHNICIAN[*]

### NATURE OF THE JOB

Aviation Electronics Technicians maintain the advanced technology radio, radar, and electronics equipment that is carried on aircraft. These technicians are responsible for the operating efficiency of equipment used for communications, navigation, automatic landings, and for the electronic identification of friendly and enemy aircraft.

The work of Aviation Electronics Technicians falls into three categories: equipment testing and analysis; maintenance and repair; and administrative tasks.

In the category of testing and analysis, Aviation Electronics Technicians operate equipment in order to evaluate its performance. This includes energizing and securing the equipment, setting operating controls; making operator's adjustments, reading dials and data displays that give feedback about how the equipment is functioning; and testing electron tubes, fuses, wiring, and lamps. Various instruments are used in this work (for example, voltmeters, ammeters, and ohmmeters) to measure electrical quantities such as voltage, current, and resistance to assure that equipment is working properly.

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In the category of equipment maintenance and repair, Aviation Electronics Technicians lubricate and clean equipment, make circuit repairs, remove, replace or repair defective parts and units, and modify equipment according to design changes.

Administrative duties include making reports on test results and repairs, keeping equipment performance records, and taking inventories of spare parts, tools and working materials. In addition, each shop has a set of technical manuals which describes the theory, testing, operation and repair of communication and navigation systems in detail. Aviation Electronics Technicians keep the manuals up to date by adding or changing information, and they recommend changes to procedures in the manuals based on their experience in testing and repairing the equipment.

## WORKING CONDITIONS

Aviation Electronics Technicians typically work in electronic shops or on the aircraft aboard aircraft carriers, at naval air stations ashore, or at any other place where Navy aircraft may be based. Much of their work is done out of doors in weather good or bad, and often there is a high level of noise in the vicinity. When working on a flight line or on the flight deck of a carrier, in addition to high noise levels, there are the additional hazards of jet engine suction, jet exhaust, spinning propellers and moving aircraft.

### Sea-Shore Rotation

Aviation Electronics Technicians spend approximately 8-10 years on "sea duty" during a 20-year period in the Navy. "Sea duty" includes all of the time during which a sailor is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home.

The remaining 10-12 years of a 20-year period in the Navy will be spent on "shore duty," duty at permanent shore locations where the Aviation Electronics Technician will provide support for fleet units.

Since Navy women do not serve aboard combatant ships, women in this rating generally work at shore facilities in the United States and overseas.

## QUALIFICATIONS

Candidates must have normal color vision and hearing, above average general learning ability, and good math skills (they must qualify on the Navy Arithmetic test). High aptitudes for electrical and mechanical work are required. Courses in algebra, trigonometry, physics, electricy, radio, and mechanics are helpful, as is experience in electrical trades. However, there are no requirements for previous training or experience.

## TRAINING PROVIDED BY THE NAVY

Candidates for this job attend Avionics Fundamentals school after they complete recruit training. Graduates of the Avionics Fundamentals school then may be selected to attend Aviation Electronics Technician school. Training covers:

- Theory of electronic equipment and its use in aircraft
- Communications systems
- Construction of motors and generators
- Principles of computers
- Characteristics and functions of insulators, resistors, inductors, transformers, and capacitors
- Operation of electronic circuits
- Principles of amplifiers, cathode followers, oscillators, and rectifiers
- Installation of electronic systems
- Use of electronic test equipment
- Transmission and reception of radar signals
- International Morse Code
- Safety precautions and first-aid for working with electrical equipment.

Aviation personnel who do not qualify for Avionics Fundamentals school after recruit training may have an opportunity to get similar training on the job and through individual study of Navy correspondence courses. They may then be eligible for Aviation Electronics Technician school.

## EMPLOYMENT OPPORTUNITY

There are approximately 10,000 men and women performing work in Aviation Electronics Technicians rating, of whom about 8,800 are rated petty officers. Shortages exist and opportunities are excellent for qualified applicants.

## ADDITIONAL INFORMATION

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# AVIATION FIRE CONTROL TECHNICIAN *

## NATURE OF THE JOB

The firing of weapons on Navy combat planes is controlled by solid state radar and computer systems. Aviation Fire Control Technicians are the electronics specialists who have responsibility for the upkeep of these weapons control systems.

The duties in this job include general maintenance, testing and repair of electronic equipment. Aviation Fire Control Technicians clean, lubricate and calibrate or adjust sights, bomb directors, and various control system components. They apply test standards for system components and operate systems to evaluate their performance. For example, they test computers, optical components, and tracking radars. They make detailed analyses of electronic, electrical, and mechanical "casualties" (system deficiencies or failures). They remove, repair, and reinstall major components and smaller parts.

This job calls for the use of circuit schematics and wiring diagrams, which the technician must be able to draw as well as interpret. The job also calls for the use of sophisticated test equipment such as computerized test benches, multimeters, vacuum tube voltmeters and oscilloscopes. The technician maintains and repairs test equipment in addition to the fire control systems themselves.

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* Each Aviation Fire Control Technician is involved in the general work of the Navy as well as in the work of his or her own "rating" or occupation. It is very important for each sailor to understand the general work of the Navy as well as the work of his or her own rating. The first chapter of this manual describes the general work of the Navy.

## WORKING CONDITIONS

Aviation Fire Control Technicians work in a shop type setting onboard aircraft carriers, at naval air stations ashore, or at any other place where Navy combat aircraft may be assigned. Much of their work is done out of doors in weather good or bad and often there is a high noise level in the vicinity. When working on a flight line or on the flight deck of an aircraft carrier, in addition to high noise levels, there are the additional hazards of jet engine suction, jet exhaust, spinning propellers and moving aircraft.

### Sea-Shore Rotation

Aviation Fire Control Technicians spend approximately 8-10 years on "sea duty" during a 20-year period in the Navy. "Sea duty" includes all of the time during which a sailor is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home.

The remaining 10-12 years of a 20-year period in the Navy will be spent on "shore duty," duty at permanent shore locations where the Aviation Fire Control Technician will provide support for fleet units.

Since Navy women do not serve aboard combatant ships, women in this rating generally work at shore facilities in the United States and overseas.

## QUALIFICATIONS

Candidates must show superior aptitude for learning complex electronic, electrical and mechanical operations, and they must make satisfactory scores on the Navy Arithmetic Test. Previous training or experience in repair shops, vocational schools, and mathematics is desirable, but are not required.

## TRAINING PROVIDED BY THE NAVY

The first step in training for this job is to attend Avionics Fundamentals school. Aviation Fire Control Technicians are chosen from among the graduates of this school.

New Technicians usually receive 19 weeks of intensive training for work on a particular type of aircraft. The specialized training is needed because of the complexity and diversity of today's aircraft and airborne weaponry. This training may be on-the-job training, classroom training, or a combination of the two.

Training for the job of Aviation Fire Control Technician includes:

- Types and terminology of various aviation fire control systems.

- Mathematics through advanced algebra and trigonometry; application of mathematical techniques in analysis, adjustment and repair of fire control systems.
- Wiring diagrams and schematic diagrams; symbols for electronic circuits and associated equipment and parts.
- Theory, purpose and performance of fire control systems in aircraft.
- Procedures for installing and operating fire control systems; procedures for testing and repairs.

## EMPLOYMENT OPPORTUNITY

There are approximately 1,550 men and women performing work in the Aviation Fire Control Technician rating, of whom about 1,200 are rated petty officers. Opportunities are excellent for qualified applicants.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

The Sailor's Rank and Occupation Page 4
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# AVIATION MACHINIST'S MATE *

## NATURE OF THE JOB

Aviation Machinist's Mates are aircraft engine mechanics. They inspect, adjust, test, repair, and overhaul aircraft engines. They also take care of routine maintenance, prepare aircraft for flight, and assist in handling aircraft on the ground and on ships.

Aviation Machinist's Mates work on both reciprocal (piston) and jet engines, and on related systems including fuel, oil, induction, cooling, compression, combustion, turbine, and exhaust systems. They also work on helicopter engines and accessory equipment. Aviation Machinist's Mates inspect aircraft before and after each flight; conduct periodic major inspections and field test engines and related systems; adjust engine components such as fuel controls, pumps, valves, and regulators; remove, repair, and replace compressor and turbine blades and combustion chamber liners; trace fuel lines, clean strainers, and check valves and fuel cells for leaks or sediment; install and clean carburetors; and test flow, pressure, and operation of carburetors and water injection systems.

For routine maintenance and flight preparation, Aviation Machinist's Mates clean planes, lubricate engines and accessories, change tires, warm up engines and refuel gas tanks. They "preserve" engines and accessories (protect them from dust, corrosion, and damage when not in use) and "depreserve" them (put them back into service).

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* Each Aviation Machinist's Mate is involved in the general work of the Navy as well as in the work of his or her own "rating" or occupation. It is very important for each sailor to understand the general work of the Navy as well as the work of his or her own rating. The first chapter of this manual describes the general work of the Navy.

Aviation Machinist's Mates may have record-keeping, safety, and supervisory duties as well as mechanics duties. They keep inventories of engines, parts, tools and supplies; keep records on the performance of engines and related systems, on test results, and on repairs; inspect work areas, tools, and equipment for potential hazards; organize and give safety instruction applicable to their work; and supervise engine work centers.

## WORKING CONDITIONS

Aviation Machinist's Mates work on the aircraft or in hanger shops aboard aircraft carriers or at naval air stations in the United States and overseas. Much of their work is done out of doors in weather good or bad, and often there is a high level of noise in the vicinity. When working on a flight line or on the flight deck of a carrier, in addition to high noise levels, there are the additional hazards of jet engine suction, jet exhaust, spinning propellers and moving aircraft. Aviation Machinist's Mates may volunteer for flight duty with aircrews.

### Sea-Shore Rotation

Aviation Machinist's Mates spend approximately 8-10 years on "sea duty" during a 20-year period in the Navy. "Sea duty" includes all of the time during which a sailor is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home.

The remaining 10-12 years of a 20-year period in the Navy will be spent on "shore duty," duty at permanent shore locations where the Aviation Machinist's Mate will provide support for fleet units.

Since Navy women do not serve aboard combatant ships, women in this rating generally work at shore facilities in the United States and overseas.

## QUALIFICATIONS

Candidates must have good general learning ability, math skills to make a satisfactory score on the Navy Arithmetic Test, and mechanical aptitude. Related experience is helpful, as are courses in algebra, geometry, machine shop, and automobile and aircraft engines. However, no previous experience or training is required.

## TRAINING PROVIDED BY THE NAVY

The Navy operates schools to teach the skills needed for this job. After recruit training, candidates are selected to attend Aviation Mechanical Fundamentals school. Graduates of that school may be selected to receive further training at the Aviation Machinist's Mate reciprocating engine and jet engine schools. Airmen who are not selected for the schools initially may receive training on the job and may take Navy correspondence courses to help them qualify for this special schooling at a later time.

Training for the job of Aviation Machinist's Mate covers:

- Math from arithmetic to elementary algebra, geometry, and trigonometry
- Basic principles of flight
- Principles of construction, weight, and balance of aircraft
- Construction and operation of aircraft engines
- Electrical and hydraulic principles as applied to aircraft propellers
- Use of hand tools, power tools, and measuring instruments
- Use of schematics for fuel, cooling, lubrication, and power transmission systems
- Procedures for engine maintenance, problem identification, and repairs
- Pollution problems and procedures for controlling pollution from incomplete combustion of fuels and from fuel or oil spills
- Safety precautions.

## EMPLOYMENT OPPORTUNITY

There are approximately 13,500 men and women performing work in the Aviation Machinist's Mate rating, of whom about 10,500 are rated petty officers. Opportunities are excellent for qualified applicants.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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## AVIATION MAINTENANCE ADMINISTRATIONMAN*

### NATURE OF THE JOB

Aviation Maintenance Administrationmen are office workers who perform a variety of clerical, administrative, and managerial duties necessary to keep aircraft maintenance activities running smoothly.

These personnel plan, schedule, and coordinate the maintenance workload, including inspections and modifications to aircraft and equipment. They issue inspection and work order forms. They keep records on the configuration, operation, maintenance, receipt, and transfer of aircraft and related equipment. They analyze data to identify trends of aircraft and system component failures. They write reports and letters, order materials, type and file. They organize and operate technical libraries; determine technical information requirements for maintenance activities; help other personnel select and use information resources; and order and distribute publications.

### WORKING CONDITIONS

Aviation Maintenance Administrationmen may be assigned to aviation squadrons at sea or ashore, to staff duty, or to facilities for aircraft maintenance or aircraft overhaul and repair.

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* Each Aviation Maintenance Administrationman is involved in the general work of the Navy as well as in the work of his or her own "rating" or occupation. It is very important for each sailor to understand the general work of the Navy as well as the work of his or her own rating. The first chapter of this manual describes the general work of the Navy.

Sea-Shore Rotation

Aviation Maintenance Administrationmen spend approximately 8-10 years on "sea duty" during a 20-year period in the Navy. "Sea duty" includes all of the time during which a sailor is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home.

The remaining 10-12 years of a 20-year period in the Navy will be spent on "shore duty", duty at permanent shore locations where the Aviation Maintenance Administrationman will provide support for fleet units.

Since Navy women do not serve aboard combatant ships, women in this rating generally work at shore facilities in the United States and overseas.

## QUALIFICATIONS

Candidates must have above-average learning ability and must be able to work harmoniously with others. They must also be conscientious in performing detailed, repetitive work and must have good organizational skills. Good reading skills are required, along with ability to evaluate technical information for completeness, accuracy and relevance to aircraft maintenance problems.

## TRAINING PROVIDED BY THE NAVY

Candidates for this job attend school at the Naval Air Technical Training Center. They may also qualify through on-the-job training, supplemented by independent study of Navy correspondence courses. Training topics include:

- The Navy Maintenance Material Management System
- Work planning, assignments, and scheduling
- How to set up status boards and keep them current (to track the progress of maintenance work)
- How to requisition publications, forms, and microfilm
- Organization and operation of technical libraries
- Preparation of reports and letters
- Touch-typing.

## EMPLOYMENT OPPORTUNITY

There are approximately 3,200 men and women performing work in the Aviation Maintenance Administrationman rating, of whom about 2,700 are rated petty officers. Opportunities are good for qualified applicants.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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# AVIATION ORDNANCEMAN *

## NATURE OF THE JOB

The Navy's aircraft armament (weapons) specialists include Aviation Ordnancemen. These personnel are in charge of storage, maintenance, inspection, and handling of all types of weapons and ammunition carried on Navy aircraft.

Aviation Ordnancemen assemble and install fuses in bombs and projectiles. They load ammunition, bombs, torpedoes, rockets and guided missiles aboard aircraft. They install, service and repair aircraft guns. They also install and service gun sights and the directional sights used in firing rockets, bombs, and torpedoes.

Aviation Ordnancemen are responsible also for aircraft pyrotechnics—fireworks used for signaling. They install, service, and use such devices as flares, drift signals (signal devices that are dropped from planes to float on the water), and smoke devices used as signals.

When assigned to patrol squadrons, Aviation Ordnancemen work as flight crew members. Other special duties include handling small arms (hand guns and rifles). Aviation Ordnancemen issue, service, and repair these weapons and teach small arms marksmanship.

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* Each Aviation Ordnanceman is involved in the general work of the Navy as well as in the work of his or her own "rating" or occupation. It is very important for each sailor to understand the general work of the Navy as well as the work of his or her own rating. The first chapter of this manual describes the general work of the Navy.

The job of an Aviation Ordnanceman involves knowledge of electricity and electronics for testing and repair work. Special equipment is used to make voltage and resistance measurements, to check for breaks in weapon circuitry, to check for short circuits, and to test grounds. Aviation Ordnancemen analyze defects in the test equipment they use, as well as in weapons and in aircraft armament systems. They must also be able to read and use schematic diagrams, drawings, charts and blueprints in order to install repair and modify aircraft equipment.

Administrative duties include ordering parts, tools and other working materials. Tools and equipment are inventoried periodically and records maintained. Aviation Ordnancemen also maintain records on aircraft armament systems—histories of their performance, repairs made and current status. In addition, each shop has a set of technical manuals which describe the theory, testing, operation and repair of armament systems in detail. Aviation Ordnancemen keep the manuals up to date by adding or changing information, and they recommend changes to procedures in the manuals based on their experience in testing and repairing the equipment.

## WORKING CONDITIONS

Aviation Ordnancemen work on the aircraft, in ammunition storage facilities, in repair shops, aboard carriers or at naval air stations. Much of their work is done out doors in weather good or bad, and often there is a high level of noise in the vicinity. When working on a flight line or on the flight deck of a carrier, in addition to high noise levels, there are the additional hazards of jet engine suction, jet exhaust, spinning propellers and moving aircraft.

### Sea-Shore Rotation

Aviation Ordnancemen spend approximately 10-12 year on "sea duty" during a 20-year period in the Navy. "Sea duty" includes all of the time durong which a sailor is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases or at naval air stations. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home.

The remaining 8-10 years of a 20-year period in the Navy will be spent on "shore duty," duty at permanent shore locations where the Ordnanceman will provide support for fleet units.

Since Navy women do not serve aboard combatant ships, women in this rating generally work at shore facilities in the United States and overseas.

## QUALIFICATIONS

Candidates must have good learning ability and high aptitude for mechanics and arithmetic. They also must have normal vision including normal ability to perceive color. Those who want flight crew-duty must pass the physical examination for aircrewmen.

School courses in algebra, physics, and electricity are helpful, as is experience in electrical or mechanical repair work. However, no previous training or experience is required to qualify.

## TRAINING PROVIDED BY THE NAVY

After recruit training selected candidates attend Aviation Ordnanceman school, which provides training in:

- Solution of mathematical problems using arithmetic, algebra, geometry, trigonometry, and vectors
- Physics, with emphasis on hydraulics, pneumatics, optics, and mechanics applicable to aviation ordnance equipment
- Basic electricity and electronics
- The use of blueprints and electrical drawings
- Types, uses, and care of hand tools and measuring instruments
- Small arms and automatic guns
- Aircraft bombs, fuses, rockets, and missiles
- Aircraft equipment such as bomb releases, launchers, and gun sights
- Operation of aircraft armament systems including installation, general servicing, and repair
- Procedures for firing aircraft machine guns and for release of bombs, rockets, torpedoes, and other missiles
- Signaling methods.

Aviation personnel who are not selected to attend Aviation Ordnanceman school after Recruit Training may receive training by working on the job and through individual study of Navy correspondence courses. Such personnel may be selected later to attend the school.

## EMPLOYMENT OPPORTUNITY

There are approximately 4,800 men and women performing work in the Aviation Ordnanceman rating, of whom about 3,600 are rated petty officers. There is a shortage of qualified applicants and opportunities are excellent for qualified personnel.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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## AVIATION STOREKEEPER*

### NATURE OF THE JOB

Aviation Storekeepers ensure that the materials and equipment needed for all kinds of naval aviation activities are available in good order. Aviation Storekeepers do jobs done in civilian life by such workers as inventory clerks, warehousemen, forklift operators, shipping and receiving agents, supply clerks, sales clerks, and typists.

Aviation Storekeepers take inventory, estimate future needs, and carry out purchasing functions. They store and issue flight clothing, aeronautical materials, spare parts, and ordnance, electronic, structural, and engineering equipment. They mark and number items for identification and maintain card files to keep track of stock movement in and out of storage. They pack stock for storage or shipment under various climate conditions.

Aviation Storekeepers handle a variety of additional clerical duties. They prepare accounting records, correspondence, and reports; they type, file, and correct or update official publications; they prepare data for storage in computers; and they verify, consult, and file computer read-outs.

In doing their work, Aviation Storekeepers use typewriters, calculators, and duplicating machines, packing or crating equipment, and equipment such as forklifts to move heavy items. They also use a variety of catalogs, manuals, indexes, and other publications. They consult microfilm records and inventory lists printed by computers.

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* Each Aviation Storekeeper is involved in the general work of the Navy as well as in the work of his or her own "rating" or occupation. It is very important for every sailor to understand the general work of the Navy as well as the work of his or her own rating. The first chapter of this manual describes the general work of the Navy.

## WORKING CONDITIONS

Aviation Storekeepers work aboard all ships that have aviation units, including aircraft carriers and some cruisers and destroyers. They are also assigned to aviation squadrons and to naval aviation facilities ashore.

### Sea-Shore Rotation

Aviation Storekeepers spend approximately 8-10 years on "sea duty" during a 20-year period in the Navy. "Sea duty" includes all of the time during which a sailor is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home.

The remaining 10-12 years of a 20-year period in the Navy will be spent on "shore duty", duty at permanent shore locations where the Aviation Storekeeper will provide support for fleet units.

Since Navy women do not serve aboard combatant ships, women in this rating generally work at shore facilities in the United States and overseas.

## QUALIFICATIONS

Candidates must have good general learning ability, good basic arithmetic skills (candidates must pass the Navy Arithmetic Test), and normal color vision. It is helpful, but not essential, to have taken courses in bookkeeping, accounting, business arithmetic, typing, office practice, and computer principles. Experience in typing, office work, or warehousing is also helpful, but not essential.

## TRAINING PROVIDED BY THE NAVY

After recruit training, selected candidates attend basic aviation school -- called the Aviation Familiarization School. From there, qualified graduates may be sent to Aviation Storekeeper School for training in:

- Introductory aviation supply
- Catalogs and publications
- Principles and procedures of buying, storing, issuing, and accounting for equipment and supplies, ashore and afloat
- Methods of taking inventory
- How to pack, box, and crate various kinds of materials and equipment for storage or shipment
- Names, classifications, and units of measurement

- Basic naval accounting
- How to prepare and audit public vouchers
- Forms of official letter-writing and memorandum-writing.

## EMPLOYMENT OPPORTUNITY

There are approximately 4,000 men and women performing work in the Aviation Storekeeper rating, of whom about 3,300 are rated petty officers. Opportunities are available for qualified applicants.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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# AVIATION STRUCTURAL MECHANIC *

## NATURE OF THE JOB

Aviation Structural Mechanics install, maintain, and repair the metal structures of aircraft, movable aircraft parts and their control systems, and aircraft body surfaces. They also maintain and repair "utility systems" such as air conditioning systems, heating systems, pressurization systems, oxygen systems, canopy and ejection systems, fire detection and extinguishing systems and safety belts and harnesses.

Aviation Structural Mechanics may specialize in safety equipment, in hydraulic systems, or in metal structures.

The work of Safety equipment specialists includes:

- Replenishing liquid and gaseous oxygen systems; removing and installing oxygen system walves, gauges, converters, and regulators
- Inspecting, installing, adjusting, and removing firing mechanisms for ejection seats, shoulder harnesses and lap-belts
- Maintaining cockpit canopy systems and aircraft pressurization systems

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* Each Aviation Structural Mechanic is involved in the general work of the Navy as well as in the work of his or her own "rating" or occupation. It is very important for each sailor to understand the general work of the Navy as well as the work of his or her own rating. The first chapter of this manual describes the general work of the Navy.

- Inspecting and installing fire detection and fire extinguishing systems and portable fire extinguishers.

The work of Hydraulics specialists includes:

- Servicing and bleeding hydraulic systems
- Inspecting, removing and replacing units of hydraulic systems
- Adjusting and repairing aircraft brakes
- Replacing gaskets and packing hydraulic components.

The work of Structural specialists includes:

- Removing, installing, and adjusting flight control surfaces
- Making wood forms, blocks, jigs, and templates for the manufacture or repair of structural parts
- Fabricating and assembling metal parts
- Making minor repairs to aircraft "skin" (outer body surface)
- Installing rivets and metal fasteners
- Mounting tires
- Painting and performing dye penetrant inspections.

Regardless of specialty, Aviation Structural Mechanics make daily aircraft inspections, special preflight and postflight inspections, and other periodic inspections. The mechanics analyze reports of malfunctions and decide what corrective action is needed. Their work involves careful attention to safety. They inspect work areas, tools, and equipment for potential hazards. Safety equipment specialists provide safety instruction on the various explosive devices in the aircraft ejection system to all members of a squadron.

Administrative duties include ordering parts, tools and other working materials. Aviation Structural Mechanics maintain records on who has custody of equipment and materials and take inventory periodically. They also maintain records on the equipment in each aircraft—histories of how it worked, repairs made and current status. In addition, each shop has a set of technical manuals which describe the theory, testing, operation and repair of aircraft metal structures, hydraulic components and safety equipment. Aviation Structural Mechanics keep the manuals up to date by adding or changing information, and they recommend changes to procedures in the manuals based on their experience in testing and repairing the equipment.

## WORKING CONDITIONS

Aviation Structural Mechanics work in shops and on the aircraft itself. They may work aboard aircraft carriers or at naval air stations in the United States and overseas. Much of their work is done out of doors in weather good or bad, and often there is a high noise level in the vicinity. When working on a flight line or on the flight deck of a carrier, in addition to high noise levels, there are the additional hazards of jet suction, jet exhaust, spinning propellers and moving aircraft.

### Sea-Shore Rotation

Aviation Structural Mechanics spend approximately 8-10 years on "sea duty" during a 20-year period in the Navy. "Sea duty" includes all of the time during which a sailor is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home.

The remaining 10-12 years of a 20-year period in the Navy will be spent on "shore duty," duty at permanent shore locations where the Aviation Structural Mechanic will provide support for fleet units.

Since Navy women do not serve aboard combatant ships, women in this rating generally work at shore facilities in the United States and overseas.

## QUALIFICATIONS

Candidates must have good learning ability and a high degree of mechanical aptitude. They must have adequate skills to pass the Navy Arithmetic Test. They must also have normal ability to perceive color.

It is helpful, but not essential, to have taken courses in wood and metal shop. Experience in automobile body work, aircraft manufacturing, and mechanical work are also useful, but are not required to qualify.

## TRAINING PROVIDED BY THE NAVY

After recruit training, candidates are selected to attend Aviation Mechanical Fundamentals school. Graduates of that school may be selected to continue training at the Aviation Structural Mechanics school. Aviation personnel who are not selected initially for these schools may qualify later, after on-the-job taining and study of Navy correspondence courses. Training covers:

- Basic flight theory.
- Types of aircraft construction; weight and balance of aircraft.

- Types, characteristics, uses, and identification markings of aircraft metals and tubing; methods of riveting, safety wiring and bonding; processes for fabricating and joining metals.
- Properties of rubber, fabrics, and plastics, and their uses in aircraft construction; repair, inspection and testing or aircraft structures and fittings made from these materials; methods of preparing and applying glues and rubber; vulcanizing processes used to repair rubber.
- Types and characteristics of paints, varnishes, lacquers, pigments, enamels, thinners, driers and cleaning substances; methods of applying these materials to aircraft surfaces.
- Maintenance procedures for aircraft structural units, including procedures for removing, installing, rigging, and aligning fuselage, wings, tail surfaces, landing gear and control cables.
- Types, uses, inspection and testing, maintenance and repair of aviation safety equipment.
- Types, names, and uses of hand tools, power tools, and measuring instruments for structural maintenance of aircraft.

## EMPLOYMENT OPPORTUNITY

There are approximately 14,500 men and women performing work in the Aviation Structural Mechanic ratings, of whom about 11,300 are rated petty officers. Opportunities are excellent for qualified applicants.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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# AVIATION SUPPORT EQUIPMENT TECHNICIAN *

## NATURE OF THE JOB

Aviation Support Equipment Technicians operate, maintain, repair and test the group equipment (commonly called "yellow equipment") that is used in handling, servicing and maintaining aircraft and aircraft systems. Ground equipment includes such items as tractors, tow bars, electrical power units (some of which are self-propelled), gas turbine air compressors (some or which again are self-propelled), portable hydraulic units, jacks and hydraulically activated work stands.

Aviation Support Equipment Technicians service, maintain and make minor repairs on support equipment electrical, generating, starting, lighting and ignition systems; operate and maintain gasoline and diesel fuel systems; use welding and other techniques to make chassis repairs; maintain hydraulic and pneumatic systems; and repair elements of engine and transmission systems.

In performing their work, Aviation Support Equipment Technicians use a variety of hand and power tools. They learn standard safety precautions for using such equipment and they also learn the special safety precautions and procedures which apply to working on and around aircraft.

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* Each Aviation Support Equipment Technician is involved in the general work of the Navy as well as in the work of his or her own "rating" or occupation. It is very important for each sailor to understand the general work of the Navy as well as the work of his or her own rating. The first chapter of this manual describes the general work of the Navy.

## WORKING CONDITIONS

Aviation Support Equipment Technicians are assigned to aviation squadrons and to aircraft carriers. Ashore, they are assigned to naval air stations in the United States and overseas. Much of their work is performed out of doors, in weather good or bad, and often there is a high noise level in the vicinity. When working on a flight line or on the flight deck of a carrier, in addition to high noise levels, there are the additional hazards of jet engine suction, jet exhaust, spinning propellers and moving aircraft.

### Sea-Shore Rotation

Aviation Support Equipment Technicians spend approximately 8-10 years on "sea duty" during a 20-year period in the Navy. "Sea duty" includes all of the time during which a sailor is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home.

The remaining 10-12 years of a 20-year period in the Navy will be spent on "shore duty," duty at permanent shore locations where the Aviation Support Equipment Technician will provide support for fleet units.

Since Navy women do not serve aboard combatant ships, women in this rating generally work at shore facilities in the United States and overseas.

## QUALIFICATIONS

Aviation Support Equipment Technicians must have good learning ability and an aptitude for electrical and mechanical work. Courses in automobile mechanics, machine shop, mathematics and physics, and experience as a machinist or automobile mechanic are helpful but not required.

## TRAINING PROVIDED BY THE NAVY

Aviation Support Equipment Technicians acquire their skills through on-the-job training and self- study of Navy training manuals and correspondence courses, and through attendance at Navy service schools. Topics covered include:

- Elementary physics
- Types of fuel, oil, hydraulic fluids and lubricants
- Names and types of aviation support equipment
- Principles of hydraulic and pneumatic systems
- Principles of internal combustion engines
- Welding and soldering techniques

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- Theory of AC and DC electricity
- Principles of magnetism
- Theory of motors and generators
- Principles and characteristics of common electrical and electronic circuit parts
- Construction and characteristics of storage batteries
- Use of hand tools, electrical measuring instruments and electrical test equipment.

## EMPLOYMENT OPPORTUNITY

There are approximately 2,100 men and women performing work in the Aviation Support Equipment Technician rating, of whom about 1,700 are rated petty officers. Opportunities are good for qualified applicants.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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# BOATSWAIN'S MATE

## NATURE OF THE JOB

The Boatswain's Mate works to keep the outside surfaces of ships in good condition, to maintain equipment on ships' decks, to handle cargo and to operate small boats. As Boatswain's Mates move up in rank, they take on more leadership duties, such as training or supervising other sailors in the duties of maintaining and handling deck equipment and in the techniques of handling small boats.

Boatswain's Mates clean and repair deck machinery, overhaul anchor chains and make items such as cargo nets and hatch covers. They tie almost any kind of knot, splice cable, do leatherwork, perform basic carpentry and sew various canvas and leather objects aboard ship. The maintenance portion of the Boatswain's Mates' work also requires them to prepare surfaces for painting, to mix paint and to paint decks and machinery.

When working as a cargo handler, the Boatswain's Mate participates in and supervises the loading, storage or unloading of cargo. An important part of this task is making sure that equipment and cargo are securely stored in case of heavy weather. The cargo handling duties of Boatswain's Mates also require them to operate and maintain heavy equipment, including derricks, crames, winches and lift trucks. They also prepare lines, chains, cables and pulleys for hoisting cargo, for towing other ships and boats, and for fueling at sea.

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* Each Boatswain's Mate is involved in the general work of the Navy as well as in the work of his or her own "rating" or occupation. It is very important for each sailor to understand the general work of the Navy as well as the work of his or her own rating. The first chapter of this manual describes the general work of the Navy.

Boatswain's Mates also care for and operate a ship's small boats. They direct the launching, use and re-storing of inflatable lifeboats during rescue operations and rescue drills. Sometimes the Boatswain's Mates serve as steersman (the person who pilots a boat) or as a signalman (the person who uses flags or lights to communicate with other boats or ships.) Boatswain's Mates often act as captains of "yard craft," the small powerboats used for getting around in harbor areas. They also serve as captains of tug boats or barges.

When performing their duties ashore, Boatswain's Mates may teach seamanship, command personnel in military drills or direct "shore patrol" (Navy police teams on shore.)

## WORKING CONDITIONS

Boatswain's Mates are assigned to all Navy ships. Many of their tasks are performed outdoors in weather good or bad on the ship's deck or on the "bridge" (the raised structure from which the ship is piloted). Some duties require physical strength, dexterity and stamina. Often tasks are performed in a noisy atmosphere. Close attention is paid to safety, orderly procedures, neatness and courtesy.

Ashore, Boatswain's Mates are assigned to naval bases in the United States and overseas.

### Sea-Shore Rotation

Boatswain's Mates spend approximately 12-14 years on "sea duty" during a 20-year period in the Navy. "Sea duty" includes all of the time during which a sailor is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home.

The remaining 6-8 years of a 20-year period in the Navy will be spent on "shore duty," duty at permanent shore locations where the Boatswain's Mate will provide support for fleet units.

Since Navy women do not serve aboard combatant ships, women in this rating generally work at shore facilities in the United States and overseas.

## QUALIFICATIONS

Boatswain's Mates must have physical strength, good vision and hearing, good manual dexterity and good aptitude for learning and leadership ability. It is helpful, but not required, for a Boatswain's Mate to have experience operating small boats and a knowledge of practical arithmetic, basic algebra, geometry and physics.

## TRAINING PROVIDED BY THE NAVY

Boatswain's Mates learn on the job from experienced personnel and through study of Navy training manuals. Among other things, they learn how to:

- Send signals to other boats, using flags, whistles and lights
- Maneuver boats in crowded places, and to understand how a boat's propellers, rudder, the wind and the current affect the movements of small boats
- Identify ships, aircraft and flags of the Navy and of other nations
- Perform the duties of a boat coxswain, (the person who steers a boat.)
- Operate ships and boats on both inland and international waterways according to set rules
- Prepare surfaces for painting and techniques for mixing and applying different types of paint
- Operate deck machinery including cranes and winches
- Maintain and employ lifeboats and other rescue equipment.

## EMPLOYMENT OPPORTUNITY

There are approximately 8,700 men and women performing work in the Boatswain's Mate rating, of whom about 8,500 are rated petty officers. Shortages exist and opportunities are excellent for qualified applicants.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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# BOILERMAKER *

## NATURE OF THE JOB

Boilermakers are repair specialists for boilers, heat exhangers and associated equipment aboard ships. They inspect, maintain (clean and protect against corrosion), repair and test shipboard boilers and also perform major repairs and overhauls.

Boilermakers analyze causes of poor boiler performance and take corrective action. They also take apart equipment such as fuel oil heaters, replace defective parts and reassemble the equipment. In major repairs and overhauls, they install new linings in boilers and replace the various parts of boilers when necessary. They conduct hydrostatic tests to make sure boilers will not explode and metallurgic tests to make sure boilermetals can withstand heat.

Administrative duties include ordering parts, tools and other work materials. Tools and equipment are inventoried periodically and records maintained. In addition, Boilermakers maintain a set of technical manuals which describe the theory, testing, operation and repair of boilers and related equipment. Boilermakers keep the manuals up to date by adding or changing information, and they recommend changes to procedures in the manuals based on their experience in testing and repairing the equipment.

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## WORKING CONDITIONS

Boilermakers are assigned to steam-propelled ships. Ashore, they may work in shipyards or at other repair facilities. Most of their work aboard ship is performed in the firerooms where the noise level is high and the temperature is usually quite warm.

### Sea-Shore Rotation

Boilermakers spend approximately 12-14 years on "sea duty" during a 20-year period in the Navy. "Sea duty" includes all of the time during which a sailor is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home.

The remaining 6-8 years of a 20-year period in the Navy will be spent on "shore duty," duty at permanent shore locations where the Boilermaker will provide support for fleet units.

Since Navy women do not serve aboard combatant ships, women in this rating generally work at shore facilities in the United States and overseas.

## QUALIFICATIONS

To be eligible for the job of Boilermaker, personnel must first work as Boiler Technicians, who are responsible for the operation and general maintenance of boilers and associated equipment on steam-propelled ships. Boiler Technicians who show special skills and aptitude for boiler repair are transferred to the Boilermaker rating at the First Class Petty Officer and Chief Petty Officer levels.

Candidates for Boiler Technician need good general learning ability and aptitude for mechanical work. Physical strength is required for working with steel and heavy duty machinery. It is helpful but not essential to have previous courses or experience in shop work and in mathematics or science.

## TRAINING PROVIDED BY THE NAVY

Boilermakers first receive training as Boiler Technicians (see the separate description for Boiler Technicians). When Boiler Technicians transfer to the Boilermaker rating, they receive additional training in the following areas:

- Boilers: Types and construction; operation; inspections and tests; boiler water problems and water treatment; how to make repairs, including welding and installing all parts of boilers.

- Auxiliary equipment: Pumps; fireroom instruments; forced draft blowers; soot blowers; fuel oil heaters; safety valves, indicators, and alarms.
- Use of hand gools, pneumatic and power-driven tools, and blueprints of boiler and fireroom machinery.
- Properties, composition, and tests of various fuel oils and fuel oil systems.
- Automatic combustion control.
- Record-keeping and report procedures; how to issue work-requests; organization of the Engineering Department; procedures for personnel supervision and training.

## EMPLOYMENT OPPORTUNITY

There are approximately 10,900 men and women performing work in the Boilermaker and Boiler Technician ratings, of whom about 6,900 are rated petty officers. Shortages exist and opportunities are excellent for qualified applicants.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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# BOILER TECHNICIAN *

## NATURE OF THE JOB

Most Navy ships are powered by steam. Boiler Technicians operate the ship's equipment that produces steam power. Personnel who display superior aptitude for boiler repair in their work as Boiler Technicians may qualifty for the rating of Boilermaker at the first class or chief petty officer level.

Boiler Technicians operate manifolds and booster pumps, light and extinguish boilers, and take charge of fireroom work. They repair boiler brickwork, fittings and casings. They clean tubes and assist in replacing broken tubes. They set safety valves, replace joints in steam and water lines and rivet and caulk seams. They do similar maintenance and repair work on all auxiliary fireroom machinery. They also test fuel oil, and boiler water. They keep records of inspections and detailed histories of machinery maintenance and repair.

In addition to their power plant duties, Boiler Technicians serve as general repairmen in case of damage to the ship. They operate rescue breathing apparatus and firefighting equipment, and they test the ship's water supplies.

## WORKING CONDITIONS

Boiler Technicians work at sea on any steam-propelled vessel. Most of their work is performed in the ship's firerooms where the noise level is high

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and the temperatures are usually quite warm. Ashore, Boiler Technicians are assigned to naval shipyards or other repair bases.

Sea-Shore Rotation

Boiler Technicians spend approximately 12-14 years on "sea duty" during a 20-year period in the Navy. "Sea duty" includes all of the time during which a sailor is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at homes bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home.

The remaining 6-8 years of a 20-year period in the Navy will be spent on "shore duty," at permanent shore locations where the Boiler Technician will provide support for fleet units.

Since Navy women do not serve aboard combatant ships, women in this rating generally work at shore facilities in the United States and overseas.

## QUALIFICATIONS

Candidates must have good learning ability and aptitude for mechanical work. Physical strength is required for working with sheet metal and heavy equipment. Previous courses or experience in shop work and in mathematics and science are useful but are not required.

## TRAINING PROVIDED BY THE NAVY

After recruiting training, candidates may attend Boiler Technician school. They may also qualify for the Boiler Technician rating through work experience, supplemented by study of Navy correspondence courses. Training covers:

- Construction, operation, and maintenance of various types of high-pressure marine boilers.
- Factors which govern the production of steam such as proper pressures and temperatures and the maintenance of efficient combustion.
- Construction and operation of various types of pumps and valves used on fireroom equipment.
- Effects of impure water on boilers and the use of chemicals in neutralizing impurities.
- Adjustments to be made to blowers, burners, fuel oil heaters, and valves under various op operating conditions.

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- Principles of combustion, viscosity, flashpoint and firepoint of fuels and lubricants.
- Factors affecting boiler efficiency and remedies for poor performance caused by such elements as soot, corrosion, grease and salt water.
- Principles governing the operation of heat exchangers such as condensers, evaporators and tube coolers.
- Blueprint reading pertaining to fireroom equipment and boilers.
- Use of mechanic's hand tools and small portable pneumatic or electrically driven tools common to maintenance of fireroom equipment.

## EMPLOYMENT OPPORTUNITY

There are approximately 10,700 men and women performing work in the Boiler Technician rating, of whom about 6,700 are rated petty officers. Shortages exist and opportunities are excellent for qualified applicants.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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## BUILDER*

### NATURE OF THE JOB

Navy construction workers are called "Builders." They may be skilled carpenters, plasterers, roofers, cement finishers, asphalt workers, masons, painters, bricklayers, heavy equipment operators, sawmill operators or cabinetmakers.

These personnel build and repair all types of structures, including piers, bridges, towers, underwater installations, schools, offices, houses and other kinds of buildings. Examples of specific jobs done by builders include:

- Carpentry: Make and erect framework; construct heavy timber units; make and erect prefabricated assemblies; do wood finishing work.
- Concrete: Build forms for concrete placing; mix and pour concrete; perform and interpret "slump" tests (tests for settling or sinking of concrete); finish concrete surfaces.
- Equipment operation: Operate portable concrete mixers, vibrators, machine trowels, power saws and all types of construction tools and equipment.
- Blueprints: Read and work from blueprints and prepare sketches for construction work.

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* Although they do not generally work aboard ship, Builders are involved in some of the general work of the Navy. It is important for every sailor to understand the general work of the Navy as well as the work of his or her own "rating." The first chapter of this manual describes the general work of the Navy.

- Estimates: Make cost estimates gased on blueprints, plans, and specifications for materials and labor required.

## WORKING CONDITIONS

Builders are assigned to naval shore facilities and to mobile construction battalions throughout the world. In the United States, they are assigned to construction schools, construction battalion centers, amphibious bases, and public works departments at other shore stations.

## QUALIFICATIONS

Candidates need good learning ability, math aptitude and a high degree of mechanical aptitude. Physical strength is required. It is helpful, but not essential, to have previous courses in carpentry and shop mathematics; experience in using hand and power tools; or experience in the building trades.

## TRAINING PROVIDED BY THE NAVY

After completion of the recuit period, training for the job of Builder may be obtained on the job, through independent study of Navy manuals or by attending Builder school. The school provides courses and work experience in:

- Mathematics for carpentry and building.
- Blueprint reading and building layout.
- Bills of materials, estimates, and job planning.
- Construction of concrete forms; concrete setting; methods of mixing mortar; techniques of laying, aligning, and bonding bricks and cinder blocks, masonry construction.
- Light frame construction, heavy frame construction, and bridging.
- Roofing, waterproofing, insulating, preserving and painting; preparation of surfaces.
- Interior and exterior carpentry.
- Cabinet work.
- Principles and uses of masts and boom derricks, A-frames, and gin poles; kinds, uses, and strength of wire rope and manila line.

- Waterfront heavy timber construction, including methods of building cofferdams; methods of pile driving; and tides and their effect on waterfront structures.

EMPLOYMENT OPPORTUNITY

There are approximately 2,600 men and women performing work in the Builder rating, of whom about 1,600 are rated petty officers. Opportunities exist for qualified applicants.

ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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# COMMUNICATIONS TECHNICIAN *

## NATURE OF THE JOB

Communications Technicians control the flow of messages and information. They do different kinds of work depending upon the career area in which they specialize. There are six different career areas in this job category:

- Administration—administrative and clerical duties involved in controlling access to classified material (Classified material is material that might give an adversary of the United States information that could be used to endanger the nation—such as military plans or technical developments. Documents are Confidential, Secret, Top Secret, etc. according to how important and potentially dangerous the information may be.)
- Interpretive—radiotelephone communications; analysis of data; preparation of statistical studies and technical reports requiring knowledge of a foreign language.
- Maintenance—installation, servicing and repair of electronic and electromechanical equipment.

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- Communications—operation of Naval Security Group communications systems and other special, worldwide communications systems.
- Collection—Morse Code communications; operation of radio direction-finding equipment; communication security duties.
- Technical—communications by means other than Morse Code; electronic countermeasures (using electronic equipment to keep others from intercepting communications).

## WORKING CONDITIONS

Communications Technicians are assigned to ships and to communications stations in the United States and overseas.

### Sea-Shore Rotation

Communications Technician spend approximately 10-12 years on "sea duty" during a 20-year period in the Navy. "Sea duty" includes all of the time during which a sailor is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at homes bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home.

The remaining 8-10 years of a 20-year period in the Navy will be spent on "shore duty," duty at permanent shore locations where the Communications Technician will provide support for fleet units.

Since Navy women do not serve aboard combatant ships, women in this rating generally work at shore facilities in the United States and overseas.

## QUALIFICATIONS

Candidates need above average learning ability and personality suited to highly detailed work that requires great accuracy. Candidates must also be eligible for a Top Secret security clearance, which means that they must be found trustworthly to handle and protect information classified as critically important to national security.

There are no requirements for previous training or experience. Previous courses in typing, office machines, English, physics and electricity are good preparation for the job. Experience as a telegrapher, radio operator, industrial electronics repairman or typist is helpful. Knowledge of a foreign language is also a valuable asset.

## TRAINING PROVIDED BY THE NAVY

After recruit training, candidates for the job of Communications Technician receive advanced training according to their specialty. The overall training includes:

- Communications systems and organization of communications networks
- Theory of electricity, electronics and magnetism
- Principles of radio wave propagation and modulation
- International Morse Code
- International procedures for communicating with ships and aircraft in distress
- Procedures for handling classified information
- Security procedures in transmitting information
- Operation of cummunication, recording, and cryptographic (coding and decoding) equipment
- Computer programming and computer operation
- Installation, maintenance and repair of electronic and electromechanical equipment
- Foreign languages.

## EMPLOYMENT OPPORTUNITY

There are approximately 9,050 men and women performing work in the Communications Technician rating, of whom about 7,900 are rated petty officers. Opportunities are good for qualified applicants.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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# CONSTRUCTION ELECTRICIAN *

## NATURE OF THE JOB

Construction Electricians are responsible for the power production and electrical work required for building and operating facilities such as airfields, roads, barracks, hospitals, shops, and warehouses. The work of Construction Electricians in the Navy is like the work done in civilian jobs by construction electricians, powerhouse electricians, telephone and electrical repairmen, substation operators, linemen, and others.

Navy Construction Electricians install high and low voltage power lines and underground electrical systems. They may work on underwater electrical systems as well. They splice and lay underground and underwater cables; erect poles for above-ground networks; attach crossarms; string wires; install distribution panels and current and voltage transformers; and install and service street lighting systems. These personnel also work on communications systems for offices and other facilities. For example, they install and repair fire alarm, public address, interoffice, and telephone switchboard systems. They do the interior wiring for lighting and operation of electrical equipment in various facilities, and they perform work in powerplants such as installing and operating generators.

The work of Construction Electricians also involves tasks such as installing, repairing, and charging batteries; installing, lubricating and repairing electrical motors; installing conduits for wiring; repairing relays, solenoids

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and switches; locating and repairing failures in grounds, short circuits, and open circuits; and checking systems for conformity to electrical specifications and blueprints. A variety of hand and power tools are used, and instruments such as ammeters, voltmeters, and ohmmeters are used to test circuits and equipment.

## WORKING CONDITIONS

Construction Electricians may be assigned to primary or advanced construction schools, to naval construction centers, to amphibious bases or, as needed, to other naval facilities in the United States. They also may be assigned to mobile units that move to overseas areas where electrical construction and maintenance work is needed.

## QUALIFICATIONS

Construction Electricians must have aptitude for electrical and mechanical work. It is helpful, but not essential to have taken courses in electricity, shop mathematics, and physics. Experience as an electrical power lineman or telephone lineman is helpful, as is experience in the construction trades. However, no previous experience is required.

## TRAINING PROVIDED BY THE NAVY

Candidates may receive training on the job and through individual study of Navy manuals, or they may receive training at Construction Electrician School. Candidates for this job learn how to:

- Install and operate power-generating and control equipment.
- Maintain, repair and overhaul power-generating and control equipment.
- Service and charge batteries.
- Climb power distribution equipment and keep pole-climbing equipment in good repair.
- Erect poles and install pole-line hardware and electrical safety devices.
- Install and connect transformers.
- Make wire and cable connections in electric distribution systems.
- String overhead telephone lines and install underground telephone cable.

- Install and splice plastic-covered telephone cable.
- Install, rewire, and repair interior telephone wiring, public address systems, and interoffice communication systems.
- Operate and repair manual telephone switchboards.

Training also provides the theory and background knowledge necessary to do the foregoing tasks. For example, Construction Electricians learn:

- Basic electrical theory.
- Construction, characteristics and uses of alternating and direct current generating equipment and motors.
- Relationships of load and generator capacity to wire, switch, and transformer sizes.
- Principles and operation of telephone exchanges and systems.
- Tools, symbols, materials, methods and equipment common to electrical and communications work.

Finally, training covers safety precautions necessary when working with or near electrical equipment, batteries, transformers, and energized wire, cables, or circuits; when using molten lead, hot compounds and taping oil in splicing telephone cable; when operating electric and pneumatic power tools, and gasoline or diesel driven air compressors; when climbing and erecting poles, etc. First-aid training includes presentations on how to rescue a person in contact with an energized circuit and how to revive a shock victim; treatment of an unconscious person, including pole-top methods; and treatment of heat and chemical burns.

## EMPLOYMENT OPPORTUNITY

There are approximately 1,500 men and women performing work in the Construction Electrician rating of whom about 1,100 are rated petty officers. Entry opportunities are limited except for highly qualified applicants.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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## CONSTRUCTION MECHANIC *

### NATURE OF THE JOB

Construction Mechanics are specialists in heavy construction and automotive equipment. They maintain the operating efficiency of buses, dump trucks, bulldozers, rollers, cranes, backhoes, pile drivers and other construction equipment and service vehicles.

Construction Mechanics lubricate, adjust and repair gasoline and diesel engines. They work on ignition and fuel systems, transmissions, electrical systems, and on hydraulic, pneumatic and steering systems. They also lubricate, prime, paint, and repair chassis, frames, and bodies; repair, test and mount tires and tubes; and test, charge, rebuild, and repair storage batteries.

Construction Mechanics use the hand tools commonly used in engine repair and overhaul. They also use the common power tools, including small lathes, power and pneumatic drills, wrenches, and valve facing machines. They use measuring instruments such as verniers, micrometers, inside and outside calipers, and feeler gages. They operate chain hoists, blocks and tackle, and jacks in moving and testing automotive machinery.

### WORKING CONDITIONS

Construction Mechanics work at construction schools, naval construction centers, amphibious bases, and, as needed, at other Navy facilities in the

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United States. They may also work in mobile units that move to overseas facilities where they are needed for construction and maintenance work.

## QUALIFICATIONS

Construction Mechanics must have good learning ability and mechanical aptitude. No previous training or experience is required. School courses in electrical shop, machine shop, shop mathematics and physics are helpful, as is previous work as a machinist, millwright, or auto mechanic.

## TRAINING PROVIDED BY THE NAVY

Construction Mechanics may receive training on the job and through individual study of Navy manuals, or they may receive training at Construction Mechanic School.

Construction Mechanics learn to perform the following kinds of work:

- Select, operate safely, and maintain portable power tools and other tools and equipment in the Mechanic's hand tool kit.
- Operate equipment and vehicles used in servicing, testing and moving construction equipment.
- Inspect, lubricate, and adjust gasoline and diesel engines; diagnose malfunctions and repair and overhaul engines.
- Rebuild engine and water pumps.
- Diagnose malfunctions in turbo-chargers and repair as required.
- Trace fuel flow using flow drawings and schematics; test, adjust and overhaul gasoline system fuel pumps, fuel injection pumps, and nozzles.
- Service and repair construction equipment and materials-handling or weight-handling equipment. Includes learning how to: dismount, repair and mount tires; remove, replace, and overhaul tracks, track rollers and idlers, track roller frames, front idlers, and recoil and equilizer springs; remove and replace hydraulic lines, cylinders, pumps, control valve assemblies; make hose using hose kits; overhaul hydraulic cylinders, pumps and control valve assemblies; overhaul single- and double-stage reciprocating compressors, rotary

air compressors, and pressure controls; overhaul winches and power takeoff units; reline and adjust hoist drum brakes and adjust hoist and swing clutches.

Construction Mechanics training also provides the theory and background knowledge necessary to perform the kinds of mechanical work just listed. The theoretical part of training covers such things as:

- Principles of internal combustion engines; construction and operation of two- and four-cycle gasoline and diesel engines.
- Principles of automotive power trains and construction equipment power trains, tracks, controls and attachments.
- Theory of hydraulics as related to brake, water, and fuel systems; types of hydraulic fluids.
- Theory of pneumatics as related to compressor, coupling, and brake systems in automotive and construction equipment.
- Theory, use, and mechanical advantages of gears, pulleys, and levers.
- Meaning and significance of viscosity, flashpoint, and firepoint of gasoline and oil; significance of gasoline octane ratings and grading of greases and oils.
- Theory of direct current; theory and construction of storage batteries.
- Shop mathematics, including ratio and proportion, decimals, and computation of areas.
- Fundamentals of the operation of buses, dump trucks, cargo trucks, prime movers used in pulling operations, bulldozers, rollers, cranes, backhoes, pile drivers, etc.

## EMPLOYMENT OPPORTUNITY

There are approximately 1,500 men and women performing work in the Construction Mechanic rating of whom 1,000 are rated petty officers. Entry opportunities are limited except for highly qualified applicants.

ADDITIONAL INFORMATION

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# DATA PROCESSING TECHNICIAN *

## NATURE OF THE JOB

Like any large business organization, the Navy has an extensive accounting system. The system is necessary to maintain personnel records (such as health, pay, qualifications, assignments and promotions); to maintain records on the receipt and transfer of supplies and the disbursement of money on ships and at shore stations; and to keep track of all equipment the Navy owns. The Navy accounting system makes use of a wide range of data processing equipment. Data Processing Technicians operate and maintain this equipment.

These technicians operate data transceivers, sorters, collaters, reproducers, interpreters, alphabetic accounting machines, and digital electronic data processing (EDP) machines for accounting and statistical purposes. In addition to operating the equipment, technicians prepare incoming data for processing and make reports on processing results. They also have office management duties such as preparing reports and correspondence, filing, ordering supplies, etc. Technicians in the higher pay grades may be programmers or systems analysts, and may participate in designing EDP systems.

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* Each Data Processing Technician is involved in some of the general work of the Navy as well as in the work of his or her own "rating" or occupation. It is very important for each sailor to understand the general work of the Navy as well as the work of his or her own rating. The first chapter of this manual describes the general work of the Navy.

## WORKING CONDITIONS

Data Processing Technicians work wherever the Navy has data processing installations. Generally, these are found in larger ships and facilities. Technicians may be assigned to guided missile frigates, aircraft carriers, submarines, and support ships of the operating (at-sea) forces; or they may be assigned to overseas bases, as well as to shore stations in the United States.

### Sea-Shore Rotation

Data Processing Technicians spend approximately 6-8 years on "sea duty" during a 20-year period in the Navy. "Sea duty" includes all of the time during which a sailor is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home.

The remaining 12-14 years of a 20-year period in the Navy will be spent on "shore duty," duty at permanent shore locations where the Data Processing Technician will provide support for fleet units.

Since Navy women do not serve aboard combatant ships, women in this rating generally work at shore facilities in the United States and overseas.

## QUALIFICATIONS

Data Processing Technicians need good learning ability, a high aptitude for clerical tasks, and aptitude for mechanical work. Previous courses or experience in typing, bookkeeping, accounting, and business machine operation are helpful, but are not required.

## TRAINING PROVIDED BY THE NAVY

Data Processing Technicians may receive their training on the job and by studying training manuals provided by the Navy. Service schools provide training in how to operate machines used at different stations.

Processing Technicians learn a variety of technical skills, including how to:

- Keypunch and verify data input cards and control cards.
- Design card layouts.
- Compute machine workloads.

[redacted]

- Set up and operate equipment such as sorters, interpreters, reproducers, collaters, accounting machines, data transceivers, and electronic processing and peripheral equipment; and to determine causes of operational failures.
- Prepare wiring diagrams and wire control panels.
- Prepare and install control tapes, punch tapes, and ribbons.
- Construct programming flow charts and decision tables.
- Design card formats.
- Analyze data input requirements for conversion of data from electronic accounting machine system to EDP system.
- Analyze and document procedures for conversion of a card-oriented EDP system to a tape or disk EDP system.

Training for Data Processing Technicians includes theory and knowledge aspects such as:

- Principles of functional wiring.
- Characteristics of binary, header, laced, magnetic, and punched cards.
- Procedures for handling and storing cards.
- Methods and purposes of guaging punch cards.
- Differences and uses of general and special purpose computers.
- Calculations and uses of binary, octal, decimal and hexa-decimal number systems.
- Characterisitcs and functions of positional notation.
- Types and uses of programming languages.
- Methods of serial, parallel, and random access processing.
- Methods and purposes of multiplexing.
- Methods and uses of fixed and floating point decimal calculations.
- Basic methods and uses of systems analysis.

These lists of skills and theoretical training are not complete, but they indicate many of the kinds of things Data Processing Technicians learn. There is also some training in safety and first-aid procedures (such as how to rescue a person in contact with an energized electrical circuit and how to revive a victim of electrical shock) and in office procedure.

## EMPLOYMENT OPPORTUNITY

There are approximately 3,500 men and women performing work in the Data Processing Technician rating, of whom about 2,600 are rated petty officers. Entry opportunities are limited except for highly qualified applicants.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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# DATA SYSTEMS TECHNICIAN*

## NATURE OF THE JOB

Data Systems Technicians are electronics technicians who specialize in computer systems. Such systems include digital computers, video processors, tape units, buffers, key sets, digital display equipment, data link terminal sets and related equipment. Data Systems Technicians maintain these devices in good operating condition. They clean, lubricate, calibrate and adjust equipment; they run operational tests, diagnose problems, make routine repairs and evaluate major repairs and newly installed parts and system units.

The work of Navy Data Systems Technicians is like the work done in civilian jobs by such people as electronic field servicemen, computer repairmen, computer systems maintenance technicians and computer operators. The following list gives examples of the specific duties in this job:

- Load and monitor diagnostic programs; record results; identify problems; and decide on corrective action.
- Analyze discrepancy trends, determine deficiencies in the system, and develop inspection procedures.
- Make minor changes in maintenance programs.
- Remove, test, and replace subsystem components including electron tubes and modular assemblies.

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* Each Data Systems Technician is involved in some of the general work of the Navy as well as in the work of his or her own "rating" or occupation. It is very important for each sailor to understand the general work of the Navy as well as the work of his or her own rating. The first chapter of this manual describes the general work of the Navy.

- Adjust electrical and mechanical units, assemblies, subassemblies, and synchros to conform with allowable limits; make point-to-point voltage measurements.
- Test for short circuits, ground, and continuity of connecting cables between components of electronic equipment; make point-to-point resistance measurements; use circuit- and signal-tracing techniques to locate defective parts within circuits; analyze waveforms to locate malfunctioning parts; make wire connections and splices.
- Supervise the installation of new equipment; evaluate system performance following overhaul, modification, or installation.

Data Systems Technicians use a variety of technical publications and manuals, logic diagrams, electrical and electronic schematics, and installation blueprints in their work. They keep these materials in good order and up-to-date. They also use a variety of test equipment (such as oscilloscopes, multimeters, frequency counters, differential voltmeters, and signal generators), and are responsible for upkeep and repair of such equipment.

## WORKING CONDITIONS

Data Systems Technicians may work at any station equipped with an electronic computer. They may be assigned to ships or to shore facilities in the United States and overseas.

### Sea-Shore Rotation

Data Systems Technicians spend approximately 10-12 years on "sea duty" during a 20-year period in the Navy. "Sea duty" includes all of the time during which a sailor is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home.

The remaining 8-10 years of a 20-year period in the Navy will be spent on "shore duty", duty at permanent shore locations where the Data Systems Technician will provide support for fleet units.

Since Navy women do not serve aboard combatant ships, women in this rating generally work at shore facilities in the United States and overseas.

## QUALIFICATIONS

**Candidates must have above-average ability in arithmetic (they must take the Navy Arithmetic Test to qualify). They must have an aptitude for detailed mechanical work, and an active interest in electronics. They also must be eligible for a security clearance. There are no specific requirements for previous training or experience. However, candidates are screened on the basis of their level of education in mathematics and physics as well as their Navy test scores. Thus previous courses in physics and mathematics, including algebra and trigonometry, are valuable to candidates. Shop training and experience in electrical or electronic trades are also very helpful, although not essential.**

## TRAINING PROVIDED BY THE NAVY

Selected candidates receive training at the Data Systems Technician School. They learn such skills as how to:

- Use the hand tools and test equipment required for the job.
- Interpret and prepare logic diagrams, installation blueprints, and electrical and electronic schematics, and to use these materials in troubleshooting and working on digital data equipment.
- Write and modify "housekeeping" programs for system maintenance.
- Service (e.g., cleaning parts with appropriate solvents, lubrication, adjustment of system components) and repair digital data equipment.
- Detect and correct errors in digital data transfer.

In short, they learn the skills required for their work described under "Nature of the Job."

On the more academic or theoretical side, training covers:

- Principles of electricity and electronics, physics, number systems and conversion methods.
- Basic principles of analog-to-digital and digital-to-analog conversion and conversion devices.
- Basic principles of magnetic recording devices.
- Principles of parallel and serial methods of data transfer.
- Basic principles of digital display devices.

Training is also provided in the safety and first-aid procedures that are needed by persons who are working with electrical and electronic equipment. Finally, training is offered in administrative procedures such as preparation of Maintenance Data Forms, supply requisitions, inventories, and reports.

## EMPLOYMENT OPPORTUNITY

There are approximately 1,650 men and women performing work in the Data Systems Technician rating of whom about 1,640 are rated petty officers. Entry opportunities are limited except for highly qualified applicants.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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# DENTAL TECHNICIAN*

## NATURE OF THE JOB

The Navy employs its own health professionals to take care of the health needs of Navy personnel. These professionals include dentists. Navy dentists, like many civilian dentists, are assisted in treating patients by Dental Technicians.

Dental Technicians in the Navy have a variety of "chairside", laboratory and administrative duties. Some are qualified in dental prosthetics (making and fitting artificial teeth), in dental x-ray techniques, in clinical laboratory procedures, in pharmacy and chemistry, or in maintenance and repair of dental equipment.

Duties that involve working directly with patients in treatment include:

- Preparing oral impression materials
- Taking x-rays
- Preparing dental cements for fillings or to fix caps and crowns, and preparing amalgams (the soft alloys of metals that are used in dental cements)
- Sterilizing instruments and arranging instrument trays

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* Each Dental Technician is involved in some of the general work of the Navy as well as in the work of his or her own "rating" or occupation. It is very important for each sailor to understand the general work of the Navy as well as the work of his or her own rating. The first chapter of this manual describes the general work of the Navy.

- Assisting in oral surgery
- Cleaning and polishing teeth
- Teaching oral hygiene to patients.

Laboratory work includes:

- Developing and processing x-rays
- Designing and building artificial teeth.

In the area of equipment maintenance, Dental Technicians install, lubricate and adjust equipment, replace parts and defective wiring, and service hydraulic systems and rotary converters. Administrative duties include scheduling appointments, maintaining charts and records on the locations and types of treatment given patients, typing correspondence, maintaining accounting and stock ledgers, and maintaining dental storerooms.

## WORKING CONDITIONS

Dental Technicians work in dental offices aboard ships and with Navy construction battalions or the Fleet Marine Forces at field locations. They work ashore at naval hospitals and dispensaries.

### Sea-Shore Rotation

Dental Technicians spend approximately 8-10 years on "sea duty" during a 20-year period in the Navy. "Sea duty" includes all of the time during which a sailor is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home.

The remaining 10-12 years of a 20-year period in the Navy will be spent on "shore duty", duty at permanent shore locations where the Dental Technician will provide support for fleet units.

Since Navy women do not serve aboard combatant ships, women in this rating generally work at shore facilities in the United States and overseas.

## QUALIFICATIONS

Applicants for this job must have completed at least two years of high school, or the equivalent, and they must have good learning ability. Applicants are interviewed by a dental officer concerning their aptitudes and interest in the types of work done by Dental Technicians.

Dental or medical experience is helpful, but is not a prerequisite for this job. It is also helpful, but not essential, to have taken courses in physiology, hygiene or chemistry.

## TRAINING PROVIDED BY THE NAVY

Training for this job is provided at Dental Technician School, where candidates learn such skills as:

- Instrument sterilization and instrument setups for dental treatment procedures.
- How to prepare materials for making impressions.
- X-ray procedures, including how to expose, process and mount films.
- Technical procedures in the dental prosthetics laboratory.
- Use of water and compressed air in treatments.
- Oral hygiene and preventive maintenance; how to prepare educational materials and present them to patients.
- First-aid treatment of casualties.
- How to prepare patients for oral surgery; charting surgical procedures; postoperative care of patients.
- Installation, preventive maintenance, repair, and service on dental equipment such as air, gas, and water systems; electrical units; motor chairs; operating room equipment; radiographic (x-ray) equipment; autoclaves and sterilizers; dental hand tools (for Dental Technicians specializing in repairs).

The more academic part of training covers:

- Elementary chemistry
- Properties and reactions of drugs used in dentistry
- Thermal characteristics of dental metals
- Anatomy and physiology
- Dental anatomy
- Diseases of the mouth and teeth and associated diseases.

## EMPLOYMENT OPPORTUNITY

There are approximately 4,000 men and women performing work in the Dental Technician rating, of whom approximately 2,000 are rated petty officers. Entry opportunities are limited except for highly qualified candidates.

## ADDITIONAL INFORMATION

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# DISBURSING CLERK*

## NATURE OF THE JOB

The Navy is a very large employer and a very large consumer of goods and services. Thus the Navy has a large staff of clerical and accounting personnel to make transactions and keep records of payments and receipts. These personnel include Disbursing Clerks, who are responsible for payrolls, allotments, expense reports, and records of receipts and expenditures of money.

Disbursing Clerks have accounting, bookkeeping, disbursing (paying out of money for supplies and services), typing, filing and other general office duties. Specifically, they do such work as:

- Compute pay and prepare payrolls for Navy personnel; keep pay records up to date with respect to such things as insurance allotments, family allowances or allotments, promotion pay raises and extra compensation; check pay receipts against payrolls.
- Process claims for expenses incurred in the line of duty, such as travel and moving expenses.
- Prepare public vouchers and U. S. Treasury checks.

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* Each Disbursing Clerk is involved in the general work of the Navy as well as in the work of his or her own "rating" or occupation. It is very important for each sailor to understand the general work of the Navy as well as the work of his or her own rating. The first chapter of this manual describes the general work of the Navy.

- Prepare reports and returns covering receipts and expenditures of public monies (money appropriated by Congress to operate the Navy).
- Furnish information to personnel about their entitlement to various types of pay and allowances and about allotment deductions and savings deposits.
- Accept personal funds and valuables for safekeeping.
- Prepare and file correspondence and records.
- Keep up to date official publications used in disbursing offices.

## WORKING CONDITIONS

All naval activities of appreciable size, whether in the United States, overseas, or at sea, employ Disbursing Clerks. At sea they work in the supply departments of ships; ashore, they work in Naval Finance Offices.

### Sea-Shore Rotation

Disbursing Clerks spend approximately 10-12 years on "sea duty" during a 20-year period in the Navy. "Sea duty" includes all of the time during which a sailor is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home.

The remaining 8-10 years of a 20-year period in the Navy will be spent on "shore duty," duty at permanent shore locations where the Disbursing Clerk will provide support for fleet units.

Since Navy women do not serve aboard combatant ships, women in this rating generally work at shore facilities in the United States and overseas.

## QUALIFICATIONS

This job requires good general learning ability, aptitude for arithmetic, ability to write figures legibly and accuracy in working with detailed information. School courses in typing, bookkeeping, accounting, business arithmetic and office practices are helpful. Experience as a bookkeeper, typist, office machine operator or cashier also is helpful. However, no previous training or experience is required to qualify for this job.

## TRAINING PROVIDED BY THE NAVY

Candidates may qualify for this job through on-the-job training and individual study of correspondence courses, or they may attend a Navy school for training.

Training covers skills such as:

- Typing; use of office machines (calculators, adding machines, graphotypes, and addressographs, etc.).
- Bookkeeping; how to compute basic pay, allowances, special and incentive pay and deductions (for taxes, insurance, savings, etc.) to obtain net pay.
- How to prepare checks and vouchers; how to prepare wage and tax statements (Internal Revenue Service Form W-2); how to prepare financial reports and returns and depository account returns.
- How to audit reports and returns.
- Procedures for opening, maintaining and closing savings accounts.

Training also covers knowledge of Navy regulations governing disbursement; titles and uses of official disbursing publications; federal and Navy regulations concerning such things as pay rates, special pay, allowances, allotments, insurance and savings bonds; and regulations governing the withholding of federal income tax and FICA tax.

## EMPLOYMENT OPPORTUNITY

There are approximately 2,150 men and women performing work in the Disbursing Clerk rating, of whom about 1,850 are rated petty officers. Opportunities are good for qualified applicants.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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# ELECTRICIAN'S MATE *

## NATURE OF THE JOB

Electrician's Mates are responsible for the operation of ship's electrical power plants, lighting systems, electrical equipment and electrical appliances. Their duties include installation, operation, adjustment, routine maintenance, inspection test and repair of electrical equipment. The following indicates the specific kinds of jobs these personnel do.

Electrician's Mates install new power and lighting circuits. They install instrument transformers and meters on power and lighting switchboards. They operate the equipment that is used to reduce interference caused by stray magnetic fields. When power system breakdowns or other emergencies occur, Electrician's Mates set up diesel generators for automatic operation, connect and energize the temporary power supply, and provide emergency power to the main distribution board from an emergency switchboard.

To assure efficient power plant operation, Electrician's Mates examine motors and generators under "load" and "no-load" conditions for cleanliness, vibration, unusual or excessive noise, overheating and lubricant leaks. They clean and lubricate electric motors and motor generator sets. They measure the insulation resistance of alternators, generators, and exciters. They locate and repair grounds, open circuits, and short circuits. They conduct bench tests on motor and generator windings, on electric governors, and on bench test controllers.

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* Each Electrician's Mate is involved in the general work of the Navy as well as in the work of his or her own "rating" or occupation. It is very important for each sailor to understand the general work of the Navy as well as the work of his or her own rating. The first chapter of this manual describes the general work of the Navy.

In caring for ship's fixtures, Electrician's Mates do such things as replace worn gaskets and seals on watertight electrical fixtures; and inspect, test, adjust, clean, lubricate and repair signal lights and searchlights. They repair portable electric tools, lights, fans and other small applicances. They service electrical components of washers and dryers and service electric ranges, ovens and deep-fat fryers in the ship's kitchen.

Electrician's Mates also have responsibility for maintaining the electrical systems in the ship's small boats. They test small boat electrical systems, diagnose malfunctions and make repairs.

Administrative duties include inventorying and ordering parts, tools and other working materials. Electrician's Mates also maintain records on ship electrical systems—histories of their performance, repairs made and current status. In addition, each shop has a set of technical manuals which describe the theory, testing, operation and repair of electrical systems in detail. Electrician's Mates keep these manuals up to date by adding or changing information, and they recommend changes to the procedures in the manuals based on their experience in testing and repairing the equipment.

## WORKING CONDITIONS

Electrician's Mates work on all types of ships and at naval shipyards, repair bases, air stations and other sites where their expertise is needed. Aboard ship, their work is often performed in spaces where the temperature is quite warm and where the noise level is high.

### Sea-Shore Rotation

Electrician's Mates spend approximately 12-14 years on "sea duty" during a 20-year period in the Navy. "Sea duty" includes all of the time during which a sailor is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home.

The remaining 6-8 years of a 20-year period in the Navy will be spent on "shore duty," duty at permanent shore locations where the Electrician's Mate will provide support for fleet units

Since Navy women do not serve aboard combatant ships, women in this rating generally work at shore facilities in the United States and overseas.

## QUALIFICATIONS

Good general learning ability is required, along with an aptitude for shop mathematics and for electrical and mechanical work. Courses in electrical shop, practical and shop mathematics, and physics are useful preparation. Experience in electrical work is also helpful. However, no previous training or experience is required to qualify for this job.

## TRAINING PROVIDED BY THE NAVY

Training is provided in Navy schools, on the job, and through training manuals furnished by the Navy for individual study. Electrician's Mates learn how to:

- Draw, read and work from schematic diagrams and blueprints of basic electrical, electronic and logic circuits.
- Interpret color coding of capacitors, resistors, multiconductor cables, chassis wiring and transformer wiring.
- Select, use and care for common electrical hand tools, including soldering equipment.
- Use an American Standard wire guage, prepare wire for installation and make splices; solder electrical connections and splices.
- Conduct bench tests; operate test and metering equipment including multimeters, voltmeters, ammeters and ohmmeters; operate tube testers; oscilloscopes; frequency meters; phase sequence meters; and instrument transformer.
- Test, repair and replace portable cables, plug-in relays, lamps, fuses, tubes, relays, switches and automatic voltage regulators.
- Maintain circuit breakers.
- Secure, start and operate AC or DC generators operating alone or in parallel; shift load between generators operating in parallel.
- Prepare and place in service new storage batteries; determine battery condition; charge and discharge storage batteries and replace dry cell batteries.
- Work safely on electrical installations.
- Administer first-aid including how to rescue a person in contact with a "live" electrical conductor; how to revive a person who is unconscious from electrical shock; and how to give first-aid for electrical and chemical burns.

On the more academic side, training courses cover the theory and basic information needed for the job. Topics include:

- Meaning of electrical and electronic terms and units of measure.
- Fundamentals of AC and DC electricity and of elementary applied mathematics (for example, how to compute current, voltage and resistance).
- Principles of electrical equipment such as generators, motors, controllers and transformers.
- Applications of the laws of magnetism to motors and generators.
- Principles of electromagnetic and magnetic circuits.
- Types of lubricants, cleaning materials and solvents used in maintenance of electrical equipment.
- Types of insulating materials and varnishes.
- Construction and types of shipboard electric cable.
- Layout of normal, alternate and emergency power-distribution systems for shipboard lighting and power systems.

## EMPLOYMENT OPPORTUNITY

There are approximately 11,700 men and women performing work in the Electrician's Mate rating, of whom about 9,900 are rated petty officers. Opportunities exist for qualified applicants.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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# ELECTRONIC WARFARE TECHNICIAN *

## NATURE OF THE JOB

Electronic Warfare Technicians operate and perform maintenance on electronic equipment that is used for navigation, for target detection and location and for stopping electronic spying on Navy activities by opposing forces. In this aspect of the job, they perform the work of advanced electronic equipment technicians. They do wiring, circuit testing and repair; test transmission lines for faulty connectors and corrosion; take measurements of sensitivity, selectivity, gain and isolation to determine the performance level of electronic equipment; install new components and modify existing electronic equipment; and test, adjust, and repair equipment cooling systems.

Sometimes they operate equipment that has to do with the interpretation of incoming electronic signals. They interpret these electronic readings to determine whether they represent surface or airborne forces, missiles or natural sources in the atmosphere. They plot intercepted radio signals to determine the course and speed of the source (which might be, for example, an airplane or ship).

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* Each Electronic Warfare Technician is involved in the general work of the Navy as well as in the work of his own "rating" or occupation. It is very important for each sailor to understand the general work of the Navy as well as the work of his own rating. The first chapter of this manual describes the general work of the Navy.

These personnel also may have other duties related to data analysis. For example, they compare equipment capabilities and limitations with intelligence reports, operational requirements, and tactical theory, so that decisions can be made about appropriate ways to counter enemy threats in actual conflict or in practice maneuvers.

Administrative duties include making reports on test results and repairs, keeping equipment performance records and taking inventories of spare parts, tools and other working materials. In addition, each shop has a set of technical manuals which describe the theory, testing, operation and repair of the electronic equipment used in their work. Electronic Warfare Technicians keep the manuals up to date by adding or changing information, and they recommend changes to the procedures in the manuals based on their experience in testing and repairing the equipment.

## WORKING CONDITIONS

Electronic Warfare Technicians are assigned to ships and to aircraft squadrons. They work as members of the flight crew on some aircraft. Ashore, they are assigned to naval bases and naval air stations in the United States and overseas.

### Sea-Shore Rotation

Electronic Warfare Technicians spend approximately 12-14 years on "sea duty" during a 20-year period in the Navy. "Sea duty" includes all of the time during which a sailor is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home.

The remaining 6-8 years of a 20-year period in the Navy will be spent on "shore duty," duty at permanent shore locations where the Electronic Warfare Technician will provide support for fleet units.

## QUALIFICATIONS

Personnel who want to become Electronic Warfare Technicians must have good general learning ability and a good understanding of basic mathematics (candidates must make satisfactory scores on the Navy Arithmetic Test). They must also have an aptitude for electronics and knowledge of the basic principles of electricity. Interested personnel must be eligible for a security clearance. Candidates are screened to determine whether they are persons who will be reliable in protecting strategic information.

## TRAINING PROVIDED BY THE NAVY

Recruit training is followed by about one year of intensive service school training in electronics and electronic warfare operations. The following list indicates the kinds of skills aquired by Electronic Warfare Technicians:

- How to operate advanced electronic equipment and associated antennas, preamplifiers and recording divices.
- How to detect and analyze electronic signals to determine their characteristics (such as frequency, pulse width, type of scan) and to determine their functions (such as search radar, fire control radar, communications).
- How to distinguish among signals from friendly and enemy ships, submarines, aircraft and landbased equipment.
- How to maintain electronic status boards and plots.
- How to determine and plot on geographic charts the positions of enemy/friendly forces.
- How to set up communications equipment used by electronic warfare personnel following communications plans and signal control plans.
- How to diagram the electronic warfare and Combat Information Center area, showing all plots and status boards that use or display electronic warfare information, and showing all internal and external circuits that pass such information.
- Selection use, and maintenance of hand tools for electronic equipment maintenance and repair.
- Procedures for inspecting, cleaning, and lubricating equipment and associated antennas.
- Procedures for testing electronic circuits for continuity, shorts and grounds; for measuring electrical quantities such as voltage, current and frequency; for evaluating circuit waveforms; for testing synchro circuits, servo-mechanisms and interconnecting circuits.
- Procedures for servicing solid state components of circuits.
- Replacement of parts of electronic equipment.

- Preparation and maintenance of logs on electronic warfare operations and equipment condition, testing and servicing.

The skills involved in this job require a base of technical knowledge and an understanding of theory. The following examples illustrate the kinds of topics covered in the more academic part of training:

- Theory of alternating and direct current (a.c. and d.c.) electricity.
- Meaning of electrical and electronic terms and units of measure; symbols for and functions of parts in electrical and electronic circuits.
- Relationship of current, voltage, phase angle, impedance, power factor and resonance in series, parallel and series-parallel circuits.
- Electrical characteristics of basic antennas; principles and radiation characteristics of parabolic and lens antennas.
- Fundamentals of Boolean algebra and symbolic logic.
- Number systems and conversion methods used in electronic digital data systems; manual and machine methods of arithmetic operations on binary numbers.
- Functions of electronic digital data systems (electronic computers) for arithmetic, control, data input/output and data storage.
- Fundamentals of infra-red and laser theory.
- Electronic characteristics and principles of threat systems; characteristics of electronic signals of different threat systems.
- Characteristics and limitations of ships' sensor and weapons systems; place of electronic warfare in overall ship offensive/defensive weapons systems.
- Effects of electronic warfare on weapon and radar systems.
- Electronic warfare code words; intelligence and tactical publications; security requirements and procedures.

## EMPLOYMENT OPPORTUNITY

There are approximately 1,200 personnel performing work in the Electronic Warfare Technician ratings, of whom about 1,150 are rated petty officers. Opportunities are excellent for qualified applicants.

## ADDITIONAL INFORMATION

Chapter 1, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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## ELECTRONICS TECHNICIAN *

### NATURE OF THE JOB

Electronics Technicians maintain the repair electronics equipment on ships and at shore stations. They specialize either in communications or in radar equipment. Electronics Technicians who specialize in communications equipment, maintain and repair communications equipment, radio countermeasures equipment, electronic coding and decoding equipment, radio direction finding equipment and long range radio receiving equipment used in navigation. Electronics Technicians who specialize in radar equipment maintain and repair electronic surface and air detection and tracking equipment, electronic recognition and identification equipment, electronic aids to navigation and radar countermeasures equipment.

Specific duties include drawing and interpreting schematic circuit diagrams of simple electronics circuits and interpreting complicated electronics wiring and circuit diagrams; making necessary operating adjustments, inlcuding the shifting of frequencies, on radio transmitters and receivers, radars and countermeasures equipment; making major repairs to standard Naval types of radio, radar and other electronics equipment; testing, isolating and replacing defective parts; and maintaining and repairing the power supply systems used for electronics equipment.

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* Each Electronics Technician is involved in the general work of the Navy as well as in the work of his or her own "rating" or occupation. It is very important for each sailor to understand the general work of the Navy as well as the work of his or her own rating. The first chapter of this manual describes the general work of the Navy.

In performing their work, Electronics Technicians use a variety of hand tools and electronic test equipment. They learn the proper care and use of such tools. They also learn first-aid techniques including treatment of personnel who are shocked or burned by electrical equipment.

Administrative duties include inventorying and ordering spare parts, tools and other working materials. Electronics Technicians also have technical manuals which describe the theory, operation, maintenance, repair and test of communications and radar equipment. Electronics Technicians keep these manuals up-to-date by adding or changing information, and they recommend changes to the procedures in the manuals based on their knowledge and experience in operating and repairing the equipment.

## WORKING CONDITIONS

Electronics Technicians are assigned to all types of ships and shore activities.

### Sea-Shore Rotation

Electronics Technicians spend approximately 10-12 years on "sea duty" during a 20-year period in the Navy. "Sea duty" includes all of the time during which a sailor is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home.

The remaining 8-10 years of a 20-year period in the Navy will be spent on "shore duty," duty at permanent shore locations where the Electronics Technician will provide support for fleet units.

Since Navy women do not serve aboard combatant ships, women in this rating generally work at shore facilities in the United States and overseas.

## QUALIFICATIONS

Electronics Technicians must have good learning ability, an interest in electronics, normal color perception and an aptitude for detailed mechanical work. They must also have a good practical knowledge of arithmetic and the ability to think clearly. Courses in radio, electricity, physics, algebra, trigonometry and shop, and experience in amateur radio, mechanical trades or electrical trades are helpful but not required.

## TRAINING PROVIDED BY THE NAVY

Electronics Technicians acquire their skills through on-the-job training and self-study of Navy training manuals and correspondence sources, and through attendance at service schools. Topics covered include:

- Theory of electronics
- Application of electronics to radar
- Theory of direct and alternating current
- Use of electronics test equipment
- Characteristics of ultrahigh and superhigh frequencies
- Use of antennas
- Use of emergency and portable power supply equipment
- Installation and maintenance of transmission lines
- Operation of motors, generators and control circuits in electronics equipment
- First-aid techniques.

## EMPLOYMENT OPPORTUNITY

There are approximately 19,000 men and women performing work in the Electronics Technician rating, of whom about 18,000 are rated petty officers. Opportunities exist for qualified applicants.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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## ENGINEERING AID *

### NATURE OF THE JOB

Engineering Aids provide construction engineers with the information they need to develop final construction plans. The Aids conduct location surveys for roads, airfields, buildings, waterfront structures, pipelines, ditches and drainage systems. They conduct soil tests and they prepare topographic maps (maps of the surface features of a land area), hydrographic maps (showing the characteristics of water areas, including bottom contour, depth soundings, currents, etc.), and triangulation maps (dividing areas into triangles for precise measurement purposes).

Engineering Aids use these kinds of data in preparing blueprints, drawings, and sketches for grading, sewers, water lines, drainage systems, underwater excavations, excavations for building foundations and architectural layouts. They also compute the amounts of soil, rock, or other material to be moved in excavating and filling operations, and estimate the costs of labor and construction materials to do the job.

During actual construction, Engineering Aids have quality control and administrative responsibilities. For example, they assist in monitoring work to ensure that it is being done according to specifications. They test concrete, asphalt and other construction materials. They prepare work schedules, progress reports and time records.

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* Although they do not generally work aboard ships, Engineering Aids are involved in some of the general work of the Navy. It is very important for each sailor to understand the general work of the Navy as well as the work of his or her own rating. The first chapter of this manual describes the general work of the Navy.

In performing their work, Engineering Aids use a variety of survey and drafting instruments including compasses, levels, slide rules, map copiers, map reducers and other more complex equipment.

## WORKING CONDITIONS

Engineering Aids work at naval shore facilities throughout the world. In the United States, they may be assigned to construction schools, naval construction battalion centers, amphibious bases, or public works departments at other shore stations.

## QUALIFICATIONS

Above-average general learning ability is required for this job, and a good background in mathematics. Engineering Aids also need an ability to visualize construction layouts and an ability to do detailed, accurate work.

It is helpful, but not essential, to have taken courses previously in algebra, geometry, trigonometry, mechanical drawing and drafting. Highway construction experience also is helpful but not essential.

## TRAINING PROVIDED BY THE NAVY

After recruit training, candidates for the job of Engineering Aid receive training in service schools. Engineering Aids learn to do field survey work such as:

- Lay out grade stakes and location stakes; sketch topographic features for reduction and plotting; take soundings of water depth using a lead-line or rod; determine positions using star sights; set up and operate instruments for measuring angles and distances; use instruments to locate points off shore; compute horizontal and vertical curves.
- Take and tag soil samples; tag soil samples for later testing for moisture content, specific gravity, compaction, and aggregate soundness (an aggregate is, simply, a clump of soil).
- Perform strength analysis tests on concrete cylinders and beams; test for concrete slump.
- Determine the volune of earth and other bulk materials to be moved, using drawings and specifications.

In drafting and map-making, Engineering Aids learn to:

- Use architect's and engineer's scales; use mechanical lettering pens and devices; do special free hand lettering; trace, revise, and fill in details on drawings and charts; make oblique drawings, using projection techniques; make multi-view drawings.
- Make construction and architectural layouts from engineering sketches and specifications.
- Make mechanical layouts of building utilities (including electrical, plumbing, heating, ventilating and air conditioning systems) from existing plans or engineering sketches and specifications.
- Make electrical schematics and plumbing diagrams from plans and sketches.
- Plot site profiles and cross sections from field notes, plans and maps.
- Lay out and draw topographic maps; revise and fill in detail on existing maps drawn from survey data.

Engineering Aids acquire project management-type skills as well. For example, they learn to:

- Decide what materials will be required; estimate quantities and cost
- Determine requirements for labor and heavy equipment and estimate costs
- Plan the sequence of work for construction projects and plan daily assignments for project crews.

Training in theory, background knowledge and technical information is provided as needed for the skills just described. This part of training covers such topics as:

- Principles of surveying; topographic and construction survey methods.
- Types, uses and care of surveying instruments and equipment; safety precautions.

- Principles of astronomy relevant to survey work.
- Principles of map layout; locating, interpreting, and correlating data for different types of maps; types of map and chart projection; uses of photography in topographic mapping.
- Standard symbols; standard drawing conventions, scales, formats, and sizes; principles of constructing geometric forms.
- Principles of plane trigonometry, plane and solid geometry and basic algebra; properties of logarithms and use of logarithmic tables; use of slide rule to multiply, divide, and determine square root; computation of ratio and proportion, reciprocals, percentage, area and volume; conversion of weights and measures, including use of the metric system.
- Characteristics of materials and conditions affecting materials including soil, concrete, bituminous materials and asphalt paving mixes.
- Uses and operation of laboratory testing equipment.

## EMPLOYMENT OPPORTUNITY

There are approximately 400 men and women performing work in the Engineering Aid rating, of whom about 300 are rated petty officers. Entry opportunities are limited except for highly qualified applicants.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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## ENGINEMAN *

### NATURE OF THE JOB

Enginemen operate, service and repair the internal combustion engines that power some of the Navy's ships and most of the Navy's small craft. Most Enginemen work with diesel engines, but some work with high-power gasoline engines, such as those used in small torpedo boats and some other small craft. Enginemen also operate and maintain the refrigeration and air-conditioning systems on diesel-driven ships, and the ship distilling plants that provide water for drinking, washing, etc.

Enginemen start and stop internal combustion engines. They do a variety of engine maintenance jobs. For example, they clean strainers and change filters; change oil in diesel engines; lubricate diesel-electric generating equipment; conduct tests and chemically treat the engines' closed cooling systems; water-test and repair piping systems; operate lubricating oil and fuel oil purifiers; check oil clearance in bearings; take thrust bearing readings; check gears for backlash and alignment; determine clearance in pumps, check alignment of pump driving units, and replace pump rotary seals; and adjust valves.

Enginemen make engine adjustments and repairs to correct problems such as: failure to start or turn over; low or high firing pressure; loss of lubricating oil pressure; high exhaust back pressure and high temperature; excessive smoke; high or low cylinder temperature; and excessive vibration. They also do major overhauls on engines and supporting systems.

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* Each Enginemen is involved in the general work of the Navy as well as the work of his or her own "rating" or occupation. It is very important for each sailor to understand the general work of the Navy as well as the work of his or her own rating. The first chapter of this manual describes the general work of the Navy.

To maintain refrigeration and air conditioning systems; Enginemen do such things as test for leaks using a halide torch; change the lubricating oil; renew oil seals and renew suction and discharge valves in refrigeration compressors; and check for noncondensable gases. In distilling plant operations, Enginemen start and stop the system; remove scales mechanically from evaporator tubes; chemically treat distilling units to remove residues; that for leaks; and replace heat exhanger tubes.

Administrative duties include inventoring and ordering parts, tools and other work materials. Enginemen also maintain records of inspections, of equipment performance and of repairs completed. In addition, they keep technical manuals which describe the theory, testing, operation and repair of engines and related equipment up to date by adding or changing information. They also recommend changes to procedures in the manuals based on their experience in testing and repairing the equipment.

## WORKING CONDITIONS

Enginemen are usually assigned to ships powered by internal combustion engines and to repair ships. Ashore, they are assigned to naval shipyards and other repair facilities in the United States and overseas. Their work generally takes place in engine rooms where the noise levels are high and the temperatures are usually quite warm.

### Sea-Shore Rotation

Enginemen spend approximately 12-14 years on "sea duty" during a 20-year period in the Navy. "Sea duty" includes all of the time during which a sailor is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home.

The remaining 6-8 years of a 20-year period in the Navy will be spent on "shore duty," duty at permanent shore locations where the Engineman will provide support for fleet units.

Since Navy women do not serve aboard combatant ships, women in this rating generally work at shore facilities in the United States and overseas.

## QUALIFICATIONS

Candidates for this job should have an interest in engines and mechanical work. They need at least average learning ability and ability to use numbers in practical problems. It is helpful to have experience in automotive repair and a background of courses in shop and shop mathematics. Courses in algebra, geometry, and physics are useful. However, no previous experience or training is required to qualify for this job.

## TRAINING PROVIDED BY THE NAVY

Candidates may attend a service school for training. They may qualify also by training on the job and studying Navy training manuals on their own.

Enginemen learn about internal combustion engines and their starting systems, about engine cooling and lubricating systems and about the fuels, lubricants, and purifiers used in them. They learn about the transmission of engine power, about piping and valves, hydraulic systems, air compressors and pumps. Specific examples of training topics include:

- Principles of diesel cycle, single-acting engines; two-stroke and four-stroke engines; and gas turbine engines.
- Construction of internal combustion engines.
- Diesel engine operation including routine starting, normal operation under way, stopping and securing; emergency starting and stopping; what to do in case of unusual noises, abnormal temperature, abnormal vibration and pressure; and abnormal operating speed.
- Gasoline engine operation including prestart procedures, starting, operation under way, fuel and fueling; spark ignition system; batteries and battery charging.
- How to purge diesel engine fuel injection system; test injectors and nozzles; inspect and repair hydraulic and mechanical governors, over-speed trips and load-limiting governors.
- Types of lubricating oil for internal combustion engine; purpose and importance of flashpoint, firepoint, pour point, carbon residue, octane number and cetane number; operation of lubricating oil purifiers; paths of lubricating oil through internal combustion engines; operation of engine lubricating systems including shunt, sump, bypass and fuel flow; causes and prevention of clogged oil holes and passages; overly high lubricating oil temperature and lubricating line leaks.

- Paths of cooling water through internal combustion engines (open and closed systems); how to perform chemical tests and treatment on an engine's closed cooling system.
- Purpose and operation of power transmission units such as reduction gears, transmissions, clutches, reverse gears, thrust bearings and hydraulic couplings.
- Operation of rotary, centrifugal and jet pumps; pump repair.
- Operation and repair of relief valves, reducing valves and temperature control valves; selection and use of grinding compounds.
- Operation of low, medium and high pressure air compressors and air compressor unloading systems.
- Operation of hydraulic steering gear and anchor windlasses (mechanism used to raise and lower anchor).
- Use and maintenance of handtools, measuring instruments, gauges and dial indicators; use of engine lathes for plain turning and cutting; use of blueprints and sketches in locating and repairing valves and piping.

## EMPLOYMENT OPPORTUNITY

There are approximately 8,700 men and women performing work in the Engineman rating, of whom about 6,500 are rated petty officers. Opportunities exist for qualified applicants.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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# EQUIPMENT OPERATOR *

## NATURE OF THE JOB

Equipment Operators are construction workers who do the jobs that require heavy machinery such as bulldozers, power shovels, pile drivers, rollers and graders, etc. Equipment Operators use such machinery to dig ditches and excavate for building foundations, to break up old concrete or asphalt paving and pour new paving, to loosen soil and grade it (level or smooth it so that construction can proceed), to dig out tree trunks and rocks, to remove debris from construction sites, to raise girders, and to move and set in place other pieces of equipment or materials needed for the job.

These personnel use several types of equipment:

- Automotive equipment (passenger vehicles, hauling vehicles up to and including five-ton dump and cargo trucks and truck tractors with semi-trailers).
- Rock crushing, batching, mixing and paving equipment.
- Drilling, blasting and demolition equipment.
- Excavating and grading equipment.
- Weight-handling and materials-handling equipment.

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* Although they do not generally work aboard ship, Equipment Operators are involved in some of the Navy's general work. It is very important for each sailor to understand the general work of the Navy as well as the work of his or her own rating. The first chapter of this manual describes the general work of the Navy.

- Quarrying and sand-blasting equipment.
- Miscellaneous equipment such as snowplows, rotary and magnetic street sweepers, truck or trailer-mounted flood light units and portable generators.

Equipment Operators perform routine maintenance on all types of equipment they use. For example, they lubricate machinery, change and inflate tires, rig cables and change attachments for various construction tasks.

They also may have administrative duties. They may, for example, dispatch automotive and construction equipment, assign motor vehicles to drivers, route equipment to garages for maintenance and repair, and maintain records on the working condition of equipment.

## WORKING CONDITIONS

Equipment Operators work where large construction projects are being carried out. In the United States, they may be assigned to construction schools, the naval construction center, amphibious bases or other shore facilities. They also may be assigned to mobile construction battalions that rotate to overseas areas.

## QUALIFICATIONS

Physical strength is required for this job, as is normal color vision. Candidates also need good general learning ability and mechanical aptitude.

## TRAINING PROVIDED BY THE NAVY

Equipment Operators may get their training through independent study of Navy manuals combined with experience on the job. Some candidates attend Equipment Operators school where they receive both classroom training and skill practice. Equipment Operators learn the following kinds of things:

- Makes, models, and types of construction equipment; terminology, operating principles and uses of construction equipment and parts.
- Operation of automotive equipment including trucks, buses, tractor-trailers and passenger vehicles.
- Operation of rubber-tired and crawler type tractors with attachments for various tasks.
- Operation of motor graders, earth-moving equipment, cranes, shovels and lifting equipment.

- Average rates of operation and mechanical limitations of equipment in loading, digging, moving, swinging, lifting and braking.
- Correct procedures for loading, hauling and dumping; determination of appropriate loads for continuous operation of equipment; maximum loads for various soil conditions.
- Blasting operations and quarry development.
- Safety precautions for use in operating equipment and for use around construction activities in general.
- Hand signals for directing equipment operators.
- Earthwork principles; road construction; principles of grading and filling; use of grade stakes and markers for excavations and grades.
- Construction and operation of gasoline and diesel engines.
- Octane ratings of gasoline, cetane number of diesel fuel and the Navy designations of lubricants used in automotive and heavy construction equipment.

## EMPLOYMENT OPPORTUNITY

There are approximately 2,500 men and women performing work in the Equipment Operator rating, of whom about 1,600 are rated petty officers. Opportunities are limited except for highly qualified applicants.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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# FIRE CONTROL TECHNICIAN *

## NATURE OF THE JOB

Fire Control Technicians maintain the control mechanisms used in weapons systems on fighting ships. Complex electronic, electrical, hydraulic, and mechanical equipment is required to ensure the accuracy of naval guided missiles, gunfire and underwater weapons. Fire Control Technicians are responsible for the operation, routine care and repair of this equipment.

The equipment operating duties of Fire Control Technicians include setting operating controls, making adjustments and checking transmissions on weapon control equipment; performing missile readiness tests and accuracy tests on control equipment for all types of weapons; and analyzing test data and computing firing corrections. The maintenance duties of Fire Control Technicians include lubrication, circuit testing and repair and module repair using printed circuit soldering techniques; inspection of motors and generators; optical alignment system checks and corrections; troubleshooting through operational tests; and adjustment, replacement, or repair of parts.

The types of equipment involved in this job include radars, analog and digital computors, weapon direction equipment and target designation systems, gyros and range finders. Fire Control Technicians also operate a variety of test instruments and equipment, which they maintain and repair in addition to the primary equipment.

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[*] Each Fire Control Technician is involved in the general work of the Navy as well as in the work of his own "rating" or occupation. It is very important for each sailor to understand the general work of the Navy as well as the work of his own rating. The first chapter of this manual describes the general work of the Navy.

Administrative duties include ordering parts, tools and other working materials. Fire Control Technicians maintain equipment custody records and take inventory periodically. They also maintain records on the ship's weapons systems—histories of their performance, repairs made and current status. In addition, each shop has a set of technical manuals which describe the theory, testing operation and repair of weapons systems in detail. Fire Control Technicians keep the manuals up to date by adding or changing information, and they recommend changes to procedures in the manuals based on their experience in testing and repairing the equipment.

## WORKING CONDITIONS

Fire Control Technicians are assigned to most fighting ships and to repair ships. Ashore, Fire Control Technicians are assigned to naval bases in the United States and overseas and to repair facilities.

### Sea-Shore Rotation

Fire Control Technicians spend approximately 12-14 years on "sea duty" during a 20-year period in the Navy. "Sea duty" includes all of the time during which a sailor is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home.

The remaining 6-8 years of a 20-year period in the Navy will be spent on "shore duty," duty at permanent shore locations where the Fire Control Technician will provide support for fleet units.

## QUALIFICATIONS

Above average general learning ability and mathematical ability are required for this job. Candidates also should have an aptitude for finely detailed mechanical work. Normal color vision is required. In addition, candidates must be eligible for a security clearance, which confirms that they are reliable individuals to have access to knowledge of national defense weapons systems.

Previous courses in radio, electricity, physics, algebra, trigonometry, and shop are very helpful, but are not required. It is also helpful, but not essential, to have experience in radio or in any mechanical or electrical trade.

## TRAINING PROVIDED BY THE NAVY

Candidates may attend service schools for training or they may follow an independent study course, using Navy manuals, and receive on-the-job training. The following list indicates some of the kinds of skills Fire Control Technicians acquire in the Navy. They learn how to:

- Read equipment dials and set weapon system operating controls according to specification.
- Counteract electromagnetic countermeasures.
- Select appropriate test equipment (for example, signal generators; oscilloscopes; voltage, current, resistance and frequency measuring devices); conduct weapon system and radar operating tests and analyze results; test components such as resistors, potentiometers, coils, capacitors, transformers and vacuum tubes, and repair or replace as needed.
- Maintain motors and generators used in fire control equipment.
- Service and repair mechanical elements such as cams, gears and lever systems and hydraulic power devices.
- Select, use and care for mechanic's hand tools.
- Trace circuits, analyze failures and make repairs.
- Clean optical lenses using proper lens paper; conduct shipboard tests of computerized gun sights; compute corrections to compensate for operator and range finder errors.
- Prepare analog and digital computers for operations; load digital computer programs; perform tests necessary for operation of servo and analog circuits; test, make replacements, set to zero, and align synchros, resolvers and other data transmission and indicating or recording devices on analog computors.

Training for Fire Control Technicians cover the theoretical background necessary to do the job, as well as the actual skills involved. The more theoretical side of training includes:

- Principles of electronics including vacuum tube characteristics, power supplies, audio and radio frequency amplifiers, oscillators, and timing, detection and modulation circuits.
- Theory and uses of electronic circuits in radars and in computing and power control equipment.

- Theory and source of direct and alternating current and effects of circuit components including resistors, inductors and capacitors, on flow of current.
- Theory and uses of electronic test equipment.
- Elementary mechanics.
- How to interpret, and work from blueprints, mechanical drawings and wiring diagrams; how to make rough drawings of mechanical parts and to prepare diagrams for electrical circuits.
- Principles of analog and digital computers; principles and uses of analog-digital and digital-analog conversions; basic digital logic; binary, octal and decimal numbering systems.
- Principles of stereo range finders; methods used to measure range finder and operator errors; how to compute error corrections.
- Properties of free and restrained gyros (instruments used to provide a fixed reference for direction finding instruments on ships and aircraft and in some weapons; purpose of damping (using resistance to inhibit the motion of the instrument).

## EMPLOYMENT OPPORTUNITY

There are approximately 7,500 personnel performing work in the Fire Control Technician rating, of whom about 6,800 are rated petty officers. Opportunity are excellent for qualified applicants

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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# GUNNER'S MATE*

## NATURE OF THE JOB

Gunner's Mates are responsible for many different kinds of weapons and ammunition, from nuclear weapons to small hand guns. They serve as weapon operators, maintenance and repair personnel and munitions storekeepers; and they teach other personnel how to handle various kinds of guns, weapons and ammunition.

Gunner's Mates use and care for small arms (including automatic pistols, rifles, carbines and light machine guns). They take these weapons apart for cleaning and oiling, reassemble them, and make adjustments for proper firing. They do the same kind of maintenance, work and perform overhauls, on the larger guns carried aboard fighting ships. They also maintain missile and rocket launchers. This requires that the Gunner's Mates understand the operation of electrical, electronic and hydraulic equipment, in order to adjust and repair such equipment.

The maintenance and repair work done by Gunner's Mates involves the use of testing instruments, such as voltage and resistance testers, as well as the use of precision measuring instruments. Gunner's Mates also use blueprints, wiring diagrams and mechanical drawings in their work, and they often make their own sketches for use in repair jobs.

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* Each Gunner's Mate is involved in the general work of the Navy as well as in the work of his own "rating" or occupation. It is very important for each sailor to understand the general work of the Navy as well as the work of his own rating. The first chapter of this manual describes the general work of the Navy.

As munitions storekeepers, Gunner's Mates store and issue explosives. They also store, issue and repair field equipment such as packs, helmets, gas masks and bayonets. In addition, they are responsible for the safety of munitions storage facilities, or "magazines." They conduct inspections and check temperatures regularly, and they operate sprinkler and flooding systems to prevent and control explosions and fires.

During battle or practice exercises, Gunner's Mates act as fire control officers and take charge of a gun or turret (a tower-like structure on a ship, usually revolving, within which heavy guns are mounted). They may also place and fire explosives; direct operation of a battery of smoke screen generators; or operate missile and rocket launchers.

Administrative duties include inventorying weapons, keeping equipment performance records, making reports on inspections and repairs, and inventorying spare parts, tools and other working materials. In addition, ships have technical manuals which describe the theory, testing, operation and repair of weapons and weapon equipment. Gunner's Mates keep these manuals up to date by adding or changing information, and they recommend changes to the procedures in the manuals based on their experience in testing and repairing the equipment.

## WORKING CONDITIONS

Gunner's Mates are assigned to all fighting ships, to nuclear weapons installations, to ordnance (weapons) depots, and to other shore facilities where large inventories of gunnery equipment are kept and maintained. Much of their work is done out of doors in weather good or bad. Conditions are sometimes hazardous, requiring much emphasis on teamwork and safety.

### Sea-Shore Rotation

Gunner's Mates spend approximately 10-12 years on "sea duty" during a 20-year period in the Navy. "Sea duty" includes all of the time during which a sailor is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home.

The remaining 8-10 years of a 20-year period in the Navy will be spent on "shore duty," duty at permanent shore locations where the Gunner"s Mate will provide support for fleet units.

## QUALIFICATIONS

Gunner's Mates need good general learning ability and a high aptitude for mechanical work. Because of the hazardous nature of guns and explosives they must also have self-confidence and the ability to remain calm under stress. Helpful preparation includes courses or other training in arithmetic, electricity, physics and shop, including shop mathematics. However, there are no requirements for previous education or experience to qualify for this job.

## TRAINING PROVIDED BY THE NAVY

Candidates may receive training on the job, supplemented by studying Navy training manuals, or by attending Gunner's Mate school. Gunner's Mates learn how to:

- Prepare guns, mounts, gun battering turrets and associated equipment for firing
- Align gunsights
- Adjust, repair and test fuze-setting devices
- Operate power-driven rocket launchers and associated equipment; prepare rocket ammunition and batteries for firing
- Attach wings and fins to missile bodies; mate and unmate missiles; assemble and disassemble missiles and missile containers; replace defective or malfunctioning missile componets or modules; install and remove adaption kits and arming-fuzing devices in missiles
- Make operational tests of missiles in launching and handling equipment; take apart, inspect and service such equipment; conduct checks before and after firing
- Diagnose malfunctions and perform repairs on mechanical, electrical, electronic and hydraulic systems and parts
- Operate ammunition hoists and other ammunition handling equipment
- Mark and safely stow ammunition
- Safely handle and dispose of unexploded bombs, rockets and shells
- Package and unpackage nuclear weapons and components; make storage monitoring tests of nuclear weapons

- Maintain and repair the equipment used to handle nuclear weapons
- Disassemble, assemble, inspect and test nuclear weapons and components; replace components to repair or modernize nuclear weapons.

This list does not cover all skills that Gunner's Mates learn, but it illustrates the kinds of training skills they receive.

Training has a theoretical side as well to provide Gunner's Mates with the background knowledge they need to do their work. On the more theoretical side, training covers such topics as:

- Electricity and electronics as applied to electrical circuits in weapon aiming and control equipment, and in mounts, turrets and hoists.
- Hydraulics and pneumatics as applied to weapons and associated equipment.
- Mechanics - including principles and uses of basic machines; types and uses of nonsparking tools, torquing tools; uses of measuring devices; mathematical computations and methods used when preparing, cutting and bending piping and tubing.
- Drawing and sketches - including common symbols and basic layout mathematics
- Nuclear weapons - including principles of fission and fusion reactions; types and effects of nuclear explosions; types and characteristics of explosives contained in nuclear weapons; types and symptoms of radiation exposure; effects of humidity, temperature, storage time, and rough handling on nuclear weapons; and cleaning solutions, lubricants, and preservatives used in maintenance of nuclear weapons.

## EMPLOYMENT OPPORTUNITY

There are approximately 6,200 personnel performing work in the Gunner's Mate rating, of whom about 5,500 are rated petty officers. Shortages exist and opportunities are excellent for qualified applicants.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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## HOSPITAL CORPSMAN *

### NATURE OF THE JOB

Hospital Corpsmen assist medical professionals in providing health care to service personnel and their families. Corpsmen have a variety of duties. They may function as pharmacists, medical technicians, food service personnel, nurses' aids, physicians or dentists' assistants, battlefield medics and more.

The work of Hospital Corpsmen falls into several categories, as follows:

- First-aid and minor surgery: Corpsmen do such things as dress wounds; remove splinters and other foreign bodies from wounds; suture minor wounds (put in stitches); give shots; give artificial respiration; treat for shock, hemorrhage and heat exhaustion.
- Patient transportation: Corpsmen move patients on stretchers, carrying tables and by hand; serve as ambulance attendants; serve as attendants in the evacuation of patients by air and ship.

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* Each Hospital Corpsman is involved in some of the general work of the Navy as well as in the work of his or her own "rating" or occupation. It is very important for each sailor to understand the general work of the Navy as well as the work of his or her own rating. The first chapter of this manual describes the general work of the Navy.

- Surgery: Corpsmen sterilize and arrange instruments for operations; act as operating room assistants and sometimes perform minor surgery.
- Patient care: Corpsmen measure pulse rates, temperature and respiration; administer medicines; serve food, make beds and adjust bed angles; maintain medical charts, recording all details of treatment; and provide other services to assure the comfort and proper care of patients.
- Prescriptions and laboratory work: Corpsmen perform clinical and laboratory procedures such as urinalysis and blood counts; under the direction of medical officers, Corpsmen fill prescriptions written by medical and dental officers.
- Food service: Corpsmen inspect foods and assist hospital food service directors in other duties.
- Clerical: In addition to maintaining patient-care records, Corpsmen prepare and type correspondence and forms required by medical activities and collect and prepare data for reports.

## WORKING CONDITIONS

Hospital Corpsmen are assigned to the sick bays or dispensaries of ships and shore stations and to naval hospitals. They may also be assigned to duty with aviation units or with the Marine Corps. They may be called upon for special duty to administer first-aid or emergency aid anywhere on ships, shore stations, or in the field with the Navy, Marine Corps or other armed services units.

Usually, Hospital Corpsmen work under Medical Corps officers as members of medical teams providing in-patient or out-patient care. On small ships and at isolated stations where there is no medical officer, they may take on more responsibilities, treating injuries and illnesses to the extent their qualifications and training allow.

### Sea-Shore Rotation

Hospital Corpsmen spend approximately 8-10 years on "sea duty" during a 20-year period in the Navy. "Sea duty" includes all of the time during which a sailor is assigned to a fleet unit (a ship, squadron or fleet staff).

Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home.

The remaining 10-12 years of a 20-year period in the Navy will be spent on "shore duty," duty at permanent shore locations where the Hospital Corpsman will provide support for fleet units.

Since Navy women do not serve aboard combatant ships, women in this rating generally work at shore facilities in the United States and overseas.

## QUALIFICATIONS

Candidates should have an interest in helping people who need medical attention and the disposition for getting along easily with others. Good general learning ability and practical math skills are required. A high school diploma is not an absolute requirement, but candidates who have

It is helpful, but not essential, to have taken courses in hygiene, biology, physiology, chemistry, typing and public speaking. It is also helpful, but not essential, to have experience in first-aid as a member of groups such as the Red Cross or Boy Scouts. Other helpful experience includes work in a drug store or hospital and school or community service activities.

## TRAINING PROVIDED BY THE NAVY

Training for this job is given in the Navy Hospital Corpsman schools. Training covers:

- Procedures for first-aid including treatment of shock, hemmorhage, sprains, burns, fractures, poisoning and asphyxia (stopped breathing); emergency surgery on abcesses, wounds, fractures and bites; application of splints.
- Use of various kinds of anesthetics and methods of administering them.
- Techniques of finding water sources and purifying and safely storing water.
- Methods of counteracting chemical warfare agents; methods of disinfecting and fumigating clothing, equipment and facilities to ensure good hygiene.
- Dietary planning; special methods of feeding.
- Fundamentals of pharmacy operation including how to properly write out, fill and dispense prescriptions.

- Nursing procedures including how to administer medicines, check temperature, pulse and other body processes, take specimens and record patient data; procedures relative to contagious diseases and general ward care.
- Operating room procedures and surgical techniques.

The skills of the Hospital Corpsman require certain theoretical training, which includes: body structure and functions of body parts; principles of hygiene and sanitation; principles of nutrition and dietetics; basic chemistry, properties, uses, dosages and effects of drugs; pharmacological measurement (metrology); basic bacteriology and clinical laboratory procedures; effects of radiology and radiology (X-ray) safety procedures.

Advanced specialty training is available to qualified Corpsmen. Specialty areas includes X-ray, pharmacy, clinical laboratory, environmental sanitation, aviation medicine, radioisotope therapy and nuclear medicine.

## EMPLOYMENT OPPORTUNITY

There are approximately 23,500 men and women performing work in the Hospital Corpsman rating, of whom about 14,000 are rated petty officers. Opportunities exist for qualified applicants.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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# HULL MAINTENANCE TECHNICIAN *

## NATURE OF THE JOB

Hull Maintenance Technicians do the metalwork and carpentry necessary to keep all types of shipboard structures and surfaces in good condition. They also take care of ship plumbing and ventilation systems, repair ships' small boats, and perform firefighting and damage control duties.

Hull Maintenance Technicians repair decks, structures and hulls (the hull is a frame or body of a ship) using such techniques as welding, soft soldering, riveting and caulking. This involves working with both light and heavy gage metals including aluminum, stainless steel, sheet brass, sheet copper, steel plates and sheet and corrugated iron. They heat-treat metals to control expansion and contraction and use hot and cold forming techniques. They employ manual shielded arc welding techniques and use portable and freed oxyacetylene torch kits among other equipment. They lay out and fabricate various metal forms and connector pieces such as funnels and elbows; they make flanges (a metal rib used to reinforce, guide, or to connect two objects), metal patches and metal tubing.

In the area of carpentry, Hull Maintenance Technicians repair wooden structures such as gangways (ramps), platforms and gratings; they replace deck coverings and deck treads; and they finish and seal wooden surfaces using stains, paint and other finishing materials.

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* Each Hull Maintenance Technician is involved in the general work of the Navy as well as in the work of his or her own "rating" or occupation. It is very important for each sailor to understand the general work of the Navy as well as the work of his or her own rating. The first chapter of this manual describes the general work of the Navy.

Steamfitting and plumbing duties include clearing systems blocks, installing, repairing or replacing salt-and fresh-water lines, steam piping, steam traps, fuel piping, flushing systems and gravity drains.

Fire prevention is another area in which these personnel have special responsibilities. In addition to servicing and repairing ventilation and sprinkling systems, Hull Maintenance Technicians are in charge of the maintenance and storage of portable emergency tools and equipment. They inspect, test and maintain fire stations; they periodically inspect, recharge and weigh portable $CO_2$ and dry chemical fire extinguishers; and they test-operate permanently installed fire control systems. During fires, they operate both portable and permanent extinguishers. After fires, they operate blower equipment to clear smoke, and other equipment to take up excess water or other extinguishing material. They also conduct post-fire checks for gas presence and adequate oxygen supply.

In damage control efforts during and after shipboard emergencies, Hull Maintenance Technicians make repairs to protect against water leaks and to ensure ship stability and proper balance ("moment") in the water.

## WORKING CONDITIONS

Hull Maintenance Technicians are assigned to all types of ships, and their work assignments take them to all parts of the ship. Ashore, they are assigned to training centers, repair facilities and other sites where their special skills are required. Much of their work aboard ship is performed in spaces where the temperatures are quite warm and the noise level is high.

### Sea-Shore Rotation

Hull Maintenance Technicians spend approximately 10-12 years on "sea duty" during a 20-year period in the Navy. "Sea duty" includes all of the time during which a sailor is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spend in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home.

The remaining 8-10 years of a 20-year period in the Navy will be spent on "shore duty," duty at permanent shore locations where the Hull Maintenance Technician will provide support for fleet units.

Since Navy women do not serve aboard combatant ships, women in this rating generally work at shore facilities in the United States and overseas.

## QUALIFICATIONS

Hull Maintenance Technicians need mechanical aptitude, good general learning ability and a knowledge of practical arithmetic. They should be self-reliant individuals who can remain calm in emergencies and act quickly under stress.

Previous schooling and experience are not required for this job. It is helpful to have taken courses in machine shop, sheet metal shop, carpentry, foundry, plumbing, mathematics (including shop mathematics), geometry, physics and chemistry. Experience in plumbing, carpentry, welding, and fire fighting are also very helpful, although not required to qualify.

## TRAINING PROVIDED BY THE NAVY

Candidates may qualify for this job through on-the-job experience, by individual study, or by attending a service school. Some of the skills they acquire include:

- Use and care of metal-working tools.
- Welding, brazing, soldering, metal-cutting and hard-surfacing on ferrous metals; how to prepare a wire rope fitting and pour a socket; how to prepare zinc chloride for use as a cleaning agent; methods of controlling metal expansion and contraction during welding; how to lay out, cut, bend and fit tubing; and template making.
- How to identify pipe, tubing and fittings by type, size, material and pressure-temperature rating; how to identify valves by size and type; how to assemble and take apart flanged and threaded sections of pipe; how to clear piping and plumbing; how to install bends, loops and hoists in piping systems; how to maintain and repair drains, volves, faucets, fire control systems, flushing systems, salt- and fresh-water piping, steam piping, steam traps and fuel piping.
- Use and care of woodworking power tools and hand tools; woodcutting and finishing.
- How to operate all types of shipboard internal-combustion emergency portable pumps; and how to operate underwater pumps.

- How to check out and operate firefighting systems and equipment; how to conduct fire safety checks.

The knowledge background provided in training for Hull Maintenance Technicians includes such things as:

- Characteristics of metals and metal alloys; basic structural steel shapes; continuous marking system for metal identification; electrode characteristics; types of tests used in metal fabrication; type of seams used in sheet metal working; principles of gas and electric heat-treating ovens and furnaces; and procedures for hardening and tempering carbon steel tools and parts.
- Types and uses of woods, woodworking glues, stains and finishes.
- Computation of board feet, liquid volumes, weight of piping and tubing and weight of steel plates and sheet metal structures.
- Use of precision measuring instruments as applied to metal work, steamfitting, plumbing and carpentry.
- Purposes and principles of constant vs. intermittent steam piping, steam traps, hydraulic control valves, pressure valves and fuel piping; normal working pressures and characteristics of gases and liquids carried by shipboard piping systems and types and uses of pipe patching materials.
- Fire hose sizes and nozzle types and their uses; pressure required for proper operation of firefighting equipment; chemistry of fires and fire extinguishing; and fire hazards and prevention.

## EMPLOYMENT OPPORTUNITY

There are approximately 10,000 men and women performing work in the Hull Maintenance Technician rating, of whom about 6,700 are rated petty officers. Opportunities are limited except for highly qualified applicants.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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# ILLUSTRATOR-DRAFTSMAN *

## NATURE OF THE JOB

The Navy employs Illustrator-Draftsmen to prepare mechanical drawings, blueprints, charts and illustrations needed for construction projects and many other Navy activities. This job category involves a variety of specialties—for example graphics, structural drafting, electrical drafting, graphic arts mechanics and illustrating.

Illustrator-Draftsmen prepare layouts of mechanisms such as belts and pulleys; of plumbing, heating, and ventilation systems; and of electrical systems and equipment. They may produce such drawings freehand, by looking at the equipment, or they may base the drawing on written specifications, on verbal description and dimensions, or on data in handbooks and other technical publications. At times Illustrator-Draftmen trace existing drawings for reproduction or rescale existing drawings. They also do such things as prepare statistical charts, organization charts, and logic diagrams; do freehand or instrument-aided lettering; make illustrative sketches and posters; prepare transparencies; and prepare photo layouts.

The work of Illustrator-Draftman involves drafting computation using fractions, decimals, square root, ratios, reciprocals and percentages. They compute volumes and areas, and convert weights, measures and electric units. Logarithmic and trigonometric tables are tools of the trade, as is the slide rule.

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* Each Illustrator-Draftsman is involved in the general work of the Navy as well as the work of his or her own "rating" or occupation. It is very important for each sailor to understand the general work of the Navy as well as the work of his or her own rating. The first chapter of this manual describes the general work of the Navy.

The job requires the use of special instruments and equipment in both the preparation and reproduction of artwork. Illustrator-Draftsmen use precision measuring instruments, drafting templates, various inks, pens, and other media. They operate blueprint and ammonia vapor type reproduction machines, silkscreen process equipment, opaque and overhead projectors and other equipment.

Administrative duties include inventorying and ordering tools and supplies. They also maintain files of completed charts, layouts, diagrams, blueprints, schematics and artwork.

## WORKING CONDITIONS

Illustrator-Draftsmen typically work at shore stations, in graphics shops or art room office areas. When assigned to sea duty, they are most frequently assigned to repair ships but serve on other large ships as well.

### Sea-Shore Rotation

Illustrator-Draftsmen spend approximately 8-10 years on "sea duty" during a 20-year period in the Navy. "Sea duty" includes all of the time during which a sailor is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home.

The remaining 10-12 years of a 20-year period in the Navy will be spent on "shore duty," duty at permanent shore locations where the Illustrator-Draftsman will provide support for fleet units.

Since Navy women do not serve aboard combatant ships, women in this rating generally work at shore facilities in the United States and overseas.

## QUALIFICATIONS

Illustrator-Draftsmen must be able to do detailed hand work neatly and precisely. They must have an aptitude for design and construction work. Skill in freehand drawing and lettering is helpful, but may be developed during training. Good general learning ability is required.

Although there are no formal requirements for previous course work, candidates for the job of Illustrator-Draftsmen need a good understanding of basic mathematics including geometry, algebra and trigonometry. Other useful school courses include art and mechanical drawing. Experience in surveying, or as a draftsmen or tracer is very helpful, but is not required to qualify.

## TRAINING PROVIDED BY THE NAVY

Candidates may qualify for this rating through experience on the job and individual study of Navy manuals. Training is also offered in service schools.

Illustrator-Draftsmen learn such things as:

- Fundamentals of mechanical drawing, including techniques of presenting cross sections and techniques of orthographic projection (three-dimensional representation).
- Standard terms, symbols and other conventions used in drafting, as well as the military standards for general drawing practices, drawing sizes, and drawing formats.
- Fundamentals of commercial art composition; drawing techniques including cartoon techniques; types of illustrative drawings for different purposes; drawing for reproduction; how to select media for commercial art; theory of color use; page layout; and photo retouching and cropping.
- Graphics reproduction methods including blueprint or ammonia vapor processes, photographic processes, and silkscreen processes.
- Operation of reproduction equipment.

Academic type training covers such subjects as:

- Mathematics as applied to graphic layout and mechanical drawing, including elementary trigonometry and algebra; fundamental operations of geometric progression; plane geometry and the measurement of line length, areas of surfaces and volumes of solids.
- Elementary mechanics.
- Fundamentals of construction systems including elements of plumbing, heating and ventilation systems.
- Elements of simple electrical circuits, electrical equipment, and power generation and distribution systems.

## EMPLOYMENT OPPORTUNITY

There are approximately 475 men and women performing work in the Illustrator-Draftsman rating, of whom about 425 are rated petty officers. Opportunities are limited except for highly qualified applicants.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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# INSTRUMENTMAN *

## NATURE OF THE JOB

Instrumentman is the name given instrument mechanics and small machine repairmen in the Navy. These personnel install, service, and repair office machines such as typewriters, mimeographs, and calculators; they calibrate guages, scales, and other precision measuring instruments; they test, adjust, and repair meters that record speed, revolutions, temperature, pressure and vacuums; and they clean and repair watches and clocks. In general, they do almost any kind of finely detailed mechanical repair, including repair of the mechanical parts of electrical equipment.

The job involves installation of equipment and basic maintenance duties such as lubrication, application of cleaning solutions and solvents, corrosion-prevention, and fine adjustments. Instrumentmen are also called upon to diagnose malfunctions and to make repairs involving replacement of parts. They may make parts—for example, bushings, stems, jewel settings, mainsprings and spring hooks—from steel, brass, silver and copper.

Instrumentmen use common hand tools, power tools such as the jeweler's lathe and drills, alcohol torches, electrical soldering equipment, and a variety of test equipment including tachometer testers, dead weight guage testers, vacuum testers and watch rate recording machines. They are responsible for maintenance and repair of their own tools and equipment. Repair work often requires the Instrumentmen to interpret blueprints and schematic drawings provided by instrument manufacturers.

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* Each Instrumentman is involved in the general work of the Navy as well as in the work of his own "rating" or occupation. It is very important for each sailor to understand the general work of the Navy as well as the work of his own rating.

Administrative duties include ordering parts, tools and other working materials. Tools and equipment are inventoried periodically and records maintained. Instrumentmen keep manufacturers' manuals and Navy technical publications up to date by adding or changing information, and they recommend changes to procedures in the manuals based on their experience in testing and repairing the equipment.

## WORKING CONDITIONS

Instrumentmen are usually assigned to repair ships and to shore stations in the United States and overseas. They usually work in a repair shop setting although they may make calls (for example, to offices) for routine maintenance and repair jobs.

### Sea-Shore Rotation

Instrumentmen spend approximately 10-12 years on "sea duty" during a 20-year period in the Navy. "Sea duty" includes all of the time during which a sailor is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home.

The remaining 8-10 years of a 20-year period in the Navy will be spent on "shore duty," duty at permanent shore locations where the Instrumentman will provide support for fleet units.

## QUALIFICATIONS

Instrumentmen need to have average general learning ability, a high degree of mechanical aptitude and manual dexterity for precision hand work.

It is helpful, but not essential, to have taken courses in shop work, blueprint reading and typing. Experience in watchmaking, typewriter repair, or other office machine repair is also helpful, but no previous experience is required to qualify.

## TRAINING PROVIDED BY THE NAVY

Instrumentmen may attend service schools for training or they may follow an independent study course, using Navy manuals, and receive on-the-job training. Among other things, they learn how to:

- Take apart, clean, lubricate, and calibrate measuring instruments.
- Follow military specifications, federal specifications, and the Metrology Requirements List

as sources of standards and guidelines for instrument calibration (metrology is the science of measurement).

- Maintain tools and machines including how to remove burrs from machine threads (burrs are rough spots or ridges that may be left when a thread is cut) and how to remove broken screws.
- Anneal (fuse metals by applying flame), temper (make metals harder or tougher by mixture with other metals), sharpen and grind metal.
- Remove and clean rubber parts of manual and electric typewriters; replace faulty parts, lubricate, adjust and reassemble typewriters.
- Repair clocks and watches including replacement of watch stems, crowns (a crown is a type of wheel in the watch or clock works), hands, jewels, and mainsprings; replacement of clock bushings (metal linings used as bearings to reduce friction) and of flat springs, wheels, and pillars (supporting pins).

These skills require a knowledge background that is also provided in service school courses and in training manuals. This side of training includes, for example:

- Instrument vocabulary (meaning of such terms as resolution, linearity, calibration, span, parallax, etc.)
- Basic mathematics (positive integers, fractions and decimals, ratio and proportion, use of graphs and tables)
- Elementary physics of fluids (atmospheric pressure, pressure and depth, adhesion and cohesion, capillarity, density, fluid friction and viscosity, flow)
- Elementary physics of heat (temperature, standard temperature reference points, temperature scales, changes of state (solids, liquids, gas), heat transfer, heat expansion; relationship of temperature, pressure and volume in gases)

- Principles of electrical circuits used in temperature measuring instruments; resistance, temperature and current in an electrical conductor; relationship of voltage resistance and current in electrical circuits
- Nomenclature and functions of measuring instruments
- Basic operation of components of hydraulic and pneumatic test equipment; characteristics of various types of tubing, pipe and fittings
- Theory and operation of guage purging systems and ultraviolet light in instrument cleaning
- Terminology of clock and watch repair
- Common causes of motion variation in clocks and watches
- Sources of standards used in instrument calibration and repair, and the content of those sources, which include Navy specifications, federal government specifications (for example, from the National Bureau of Standards) and manufactureres' specifications.

## EMPLOYMENT OPPORTUNITY

There are approximately 400 personnel performing work in the Instrumentman rating, of whom about 300 are rated petty officers. Opportunities are limited except for highly qualified applicants.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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# INTERIOR COMMUNICATIONS ELECTRICIAN *

## NATURE OF THE JOB

Interior Communications Electricians install and maintain the equipment needed for communications within ships and at shore facilities. On a large ship, the internal communications system can be quite complex and use many different kinds of equipment. A public address system is necessary so that notices, instructions, and/or warnings can be transmitted to all parts of the ship at once. A telephone system is required, as in any work facility. There are alarm systems of various kinds. Electronic megaphones are used to coordinate deck work and other types of announcing equipment are used for entertainment and other purposes.

The engine telegraph is a type of interior communications equipment. The engine telegraph is used to relay engine speed orders from the pilothouse to the engine room below.

Certain kinds of ship control and equipment-monitoring devices also are part of the interior communications system. These devices monitor and regulate the rates of current in electrical and electronic equipment used to control equipment operations, or they check the timing of electrical impulses from two sources of alternating current and show whether the incoming source is fast, slow, or timed correctly. Some devices contain mechanisms that make any needed adjustments automatically.

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* Each Interior Communications Electrician is involved in the general work of the Navy as well as in the work of his or her own "rating" or occupation. It is very important for each sailor to understand the general work of the Navy as well as the work of his or her own rating. The first chapter of this manual describes the general work of the Navy.

The ship's gyrocompass is also considered part of the interior communications system. The gyrocompass is a navigational aid that gives information about the ship's position relative to true North. The rudder position indicator is another type of interior communications equipment. This electronic device provides feedback to the pilothouse or operations center about the position of the ship's rudder (a flat, fin-like piece that extends under a vessel into the water and is connected to the steering piece (the wheel or tiller).

Interior Communications Electricians also care for various audio and audiovisual equipment used for entertainment and instruction. For example, they are responsible for maintenance and repairs on a.m./f.m. radios, tape recorders, closed-circuit televisions and motion picture projectors.

Interior Communications Electricians do such specific tasks as:

- Prepare wire for installation, making standard splices.
- Use standard test and metering instruments to make sure electrical equipment operates properly (test and metering instruments include multimeter, voltmeter, ammeter, ohmmeter, tube tester, mechanical tachometer to measure engine revolutions, oscilloscope, signal generator and transistor tester).
- Test and repair or replace portable and permanently installed cables; plug-in relays; lamps, fuses, tubes, and other electronic components.
- Apply lubricants, cleaning agents, and solvents to electrical equipment parts.
- Install and replace microphone and earpiece assemblies, cords, plugs, jack boxes and amplifiers of portable, sound-activated telephones. (Sound-activated telephones are similar to "walkie-talkies". They are used for communications among members of work teams who may be at different locations on the ship. They are also used as an emergency telephone backup in case of power failure.)
- Service the automatic telephone exchange system, making repairs to switchboard, receivers and line station wiring.
- Energize (connect to power source), start, test, and operate ship control and alarm systems.

- Perform maintenance on electronic plotters used in navigation and on underwater electrical devices used for data collection about various water conditions.
- Energize and secure circuits on internal communications switchboards; test circuits for continuity, shorts, and grounds; measure voltage, current and power in internal communications circuitry; diagnose malfunctions; test, remove, and install instrument transformers and meters on internal communications switchboards.

## WORKING CONDITIONS

Interior Communications Electricians usually work aboard ships, although there are some shore assignments at naval shipyards and repair bases. Aboard ship Interior Communications Electricians are assigned to duty on the interior communications switchboard or to maintenance and emergency repair duty on various equipment in the interior communications systems. Ashore, they are assigned to naval shipyards and other repair facilities.

### Sea-Shore Rotation

Interior Communications Electricians spend approximately 12-14 years on "sea duty" during a 20-year period in the Navy. "Sea duty" includes all of the time during which a sailor is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home.

The remaining 6-8 years of a 20-year period in the Navy will be spent on "shore duty," duty at permanent shore locations where the Interior Communications Electrician will provide support for fleet units.

Since Navy women do not serve aboard combatant ships, women in this rating generally work at shore facilities in the United States and overseas.

## QUALIFICATIONS

Candidates for this job are required to have good general learning ability, aptitude for electrical work, and normal ability to distinguish color. Courses in electrical shop and mathematics are helpful preparation but are not required. Experience in electrical work is also helpful, but not required.

## TRAINING PROVIDED BY THE NAVY

The Navy provides training for the job of Interior Communications Electrician at service schools. Candidates may get training on the job as well, and by studying Navy manuals. The training program covers the following fundamental skills:

- Use of electricians' hand tools and bench tools including soldering equipment, splicing tools and electrical testing instruments.
- Reading blueprints and electrical diagrams; drawing working diagrams.
- Operation and maintenance of basic electrical equipment including generators, motors, controllers and transformers.
- Operation and maintenance of automatic and sound-powered telephones; alarm, warning and call bell systems; announcing systems; and gyrocompasses and indicating instruments.

The theoretical training provided to Interior Communications Technicians includes:

- Electrical terms and units of measure.
- Relationships between electrical units of measure (current, voltage, impedance, resistance, etc.) and methods of calculating and converting electrical quantities in alternating and direct current (AC and DC) circuits.
- Basic theory and principles of: voltage production; wet and dry cell batteries; Ohm's law; electromagnetic and magnetic circuits; conductors and insulators; electron tubes; electronic power supplies and regulators; magnetic, electronic tube, and transistor amplifiers; logic circuitry; and tuned circuits.
- Power sources for all voice communications systems; principles of conversion of sound to electrical signal and back to sound in voice communication systems.

## EMPLOYMENT OPPORTUNITY

There are approximately 4,900 men and women performing work in the Interior Communications Electrician rating, of whom about 3,900 are rated petty officers. Opportunities exist for qualified applicants.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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# JOURNALIST *

## NATURE OF THE JOB

Navy Journalists are information specialists. They write press releases and news stories, feature stories, and articles for Navy newspapers, bulletins and magazines, for home-town newspapers of Navy personnel, and for the general press. They proofread, select photographs to go with stories, and lay out copy and artwork for printing and other forms of reproduction. Some work as photographers; some write scripts and announcements for radio and television; some arrange and produce radio programs. Journalists may also do a variety of public relations jobs. For example, they write speeches; they help public affairs officers establish and maintain contact with community and news media representatives; and they arrange special events such as displays and exhibits, open-house demonstrations, speaking engagements and press conferences.

In news gathering and reporting, Navy Journalists work in the same way as other reporters. They develop contacts for news sources, keep well informed about what goes on around them, and develop a sense for the news potential of events. Journalists get material by witnessing events, by conducting in-person and telephone interviews, by examining messages and wire stories (news stores electrically dispatched by teletype), and by various kinds of research. They prepare wire-service dispatches themselves and write first-coverage, straight news accounts. In addition, they do special reporting jobs.

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* Each Journalist is involved in some of the general work of the Navy as well as in the work of his or her own "rating" or occupation. It is very important for each sailor to understand the general work of the Navy as well as the work of his or her own rating. The first chapter of this manual describes the general work of the Navy.

For example, they prepare advance stories to stimulate interest in coming events; they rewrite news from other sources, setting it in special-interest perspective or treating it in a different way than the original version and they write follow-up stories for spot news releases.

Journalists working in radio and television write feature material, news, and spot announcements; select visual material to support television scripts, and tape interviews and other live TV or radio material. Taping responsibilities include operation of magnetic tape recorders and tape editing and splicing to produce a final broadcast version.

The photography work of Journalists ranges from administrative and clerical tasks to film processing. Journalists arrange photography sessions. They maintain photograph files and keep records on photographs issued to news media and to the public. The select photographs for publication. They also take news photographs, using standard Navy still cameras, and process exposed film and prints for reproduction.

Journalists to page layout work as well, for guidebooks, brochures, newspapers and other Navy publications. Page layout involves selecting the size and style of type to be used, cropping and scaling photographs and other artwork; writing headlines and captions for photographs to fit available space; arranging artwork and printed matter on a makeup page for printing and writing instructions for printers.

## WORKING CONDITIONS

Journalists usually work in offices at larger Navy facilities—either ships or shore stations. They may visit smaller facilities and help to set up public information programs or guidelines for them.

### Sea-Shore Rotation

Journalists spend approximately 6-8 years on "sea duty" during a 20-year period in the Navy. "Sea duty" includes all of the time during which a sailor is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home.

The remaining 12-14 years of a 20-year period in the Navy will be spent on "shore duty," duty at permanent shore locations where the Journalist will provide support for fleet units.

Since Navy women do not serve aboard combatant ships, women in this rating generally work at shore facilities in the United States and overseas.

## QUALIFICATIONS

Journalists must have above average learning ability and good writing skills in English. They must be able to think critically and to write clearly, accurately and quickly. A high degree of clerical aptitude is required. Other personal characteristics that Journalists need include ability to listen and observe carefully, ability to make acquaintances easily, initiative, imagination and a habit of regular critical reading.

There are no requirements for previous training or experience to qualify for this job. Helpful school courses include English, journalism and typing. Writing experience or work on a school newspaper also is helpful, although not essential.

## TRAINING PROVIDED BY THE NAVY

Candidates for this job train at the Defense Information School and on the job, under the direction of trained journalists. Navy training manuals also are provided for study. The basic training covers news gathering, writing, and editing; newspaper layout and makeup; news photography; the use of radio and television in the Navy public affairs program; Navy public relations and public affairs policy; history of the United States Navy from the Revolutionary War to the present and military orientation and naval correspondence procedures.

The following are examples of skills and knowledge that Journalists learn during training and as they gain experience on the job:

- Fundamentals of news style including standard ways of organizing a news story; types of stories and leads (opening paragraphs)
- Research techniques and sources of information, both contemporary and historical
- Public affairs ethics; meaning of slander and libel; Navy and Defense Department regulations about the release of information
- Symbols used in copy editing, procedures for galley and page proofreading to catch errors before the material is printed or mimeographed, (a galley is a wooden frame in which pieces of type are arranged to make the story); general rules of English grammar, usage and spelling
- How to prepare artwork for reproduction
- Procedures for page layout

- Printing processes, including capabilities and limitations of mimeograph, multilith, and offset printing processes; how to set up copy for printing and to write specifications for the printer
- Operation of still cameras; photograph composition; color photography techniques
- Film processing; preparation of prints for reproduction; use of transparencies and negatives
- Radio and TV station organization; use of production equipment; techniques of personal, radio, and TV interviewing; reporting eyewitness accounts; recording news events; techniques of script-writing for TV film; Federal regulations concerning the broadcast media; Navy radio/TV policy
- Public relations and public information techniques including: acquainting Navy personnel, ships and facilities with the community and the news media; participation in community services and events; special Navy activities such as open houses, speaking engagements, exhibits and guest cruises; regulations about shipboard and aircraft guests including media representatives and others; requirements of the various news media; types of material from the Navy that may be of interest to different media; protocol, honors, ceremonies, customs and traditions in the Navy, and sources of information about them.

## EMPLOYMENT OPPORTUNITY

There are approximately 600 men and women performing work in the Journalist rating, of whom about 470 are rated petty officers. Opportunities exist for highly qualified applicants.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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## LEGALMAN *

### NATURE OF THE JOB

Legalmen are trained aides who assist professionals in the field of law. They work in Navy legal offices, under the direction of Judge Advocates, doing administrative and clerical tasks necessary to process claims, to conduct court and administrative hearings, and to maintain the records, documents and reference libraries of legal offices. Legalmen also investigate claims and advise personnel and command offices about such matters as tax returns, voter registration procedures, immigration and customs regulations, regulations governing social security and veteran's benefits, procedures for applying for benefits and other legal administrative matters. In routine office activities, Legalmen organize files, type notices and correspondence and take and transcribe dictation.

Investigation activities include obtaining medical records and accident reports for prosecution and defense counsels, conducting interviews with witnesses, and obtaining and reviewing other information needed to resolve issues.

Legalmen have a number of duties related to courts martial and nonjudicial hearings. They use tape recorders, stenotype machines, and shorthand to record courtroom and mast proceedings, and they type transcripts of these records. (A mast proceeding is a nonjudicial hearing before the commanding officer of a ship or shore station. Mast proceedings are used as

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preliminary hearings, to decide whether a court martial should be convened, or to resolve noncriminal offenses involving the breaking of Navy regulations. Mast proceedings also may be requested by personnel who have grievances, and there may be "meritorious mast" in which honors are awarded. The term is an old one, from the days when ship captains received reports, investigated problems, meted out punishment, awarded citations, and, in general, conducted formal communications with ship's personnel in front of the main mast.)

Legalmen prepare and mail subpoenas (orders "under penalty" for witnesses to appear on behalf of the government); they also arrange for travel money and witness fees, and are responsible for paying these to witnesses. They prepare search and seizure orders used in obtaining evidence. They set up procedures for identifying and protecting evidence, and they prepare evidence to be sent to laboratories for analyses.

Legalmen schedule the courtroom and notify all people involved of the time, date and place of the proceedings. After proceedings have been completed, Legalmen prepare trial records and other reports as directed.

Another important part of a Legalman's job is to help Navy personnel and their families understand and satisfy legal requirements in business affairs such as taxes, motor vehicle licensing and driver registration, social security and veteran's benefits. Legalmen also provide assistance to Navy personnel who marry citizens of other countries or have children overseas. When Navy personnel get involved in civil disputes, a Legalman may help them get a civilian counsel. Legalmen also prepare wills and powers-of-attorney (a power of attorney is a document by which a person may authorize someone else to act as his attorney or agent in legal matters).

## WORKING CONDITIONS

Legalmen are assigned to Navy legal offices aboard ship and at shore facilities in the United States and overseas. In the United States, the majority of legal officers and Legalmen are assigned to Navy Legal Services offices, which are law centers placed in key locations where they can provide legal services for large numbers of Navy personnel.

### Sea-Shore Rotation

Legalmen spend approximately 8-10 years on "sea duty" during a 20-year period in the Navy. "Sea duty" includes all of the time during which a sailor is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent inport at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home.

The remaining 10-12 years of a 20-year period in the Navy will be spent on "shore duty," duty at permanent shore locations where the Legalman will provide support for fleet units.

Since Navy women do not serve aboard combatant ships, women in this rating generally work at shore facilities in the United States and overseas.

## QUALIFICATIONS

Legalmen need an aptitude for detailed work as well as good general learning ability. The job also requires a good deal of personal interaction with coworkers, with clients who need assistance and with other people who are involved. Legalmen need to be able to relate easily to others and to work with others harmoniously.

Courses in English and business subjects such as typing and stenography are good preparation for those who are interested in becoming Legalmen. Clerical experience also is helpful. However, no previous training or experience is required.

Candidates for the Legalmen rating must first achieve the rating of Yeoman Third Class (an entry level position). The Yeoman Third Class does general office work, including typing and stenography, filing, etc. Yeomen may choose to specialize in the legal field as they advance.

## TRAINING PROVIDED BY THE NAVY

The entry-level position for Legalmen is "Legalman Second Class." Yeomen who want to specialize in legal work may attend the Legal Clerk and Court Reporting Course at the Naval Justice School. They also may qualify through on-the-job instruction and correspondence courses.

The basic training for Legalmen covers typing; shorthand; use of closed microphone recording systems and stenotype equipment for recording courtroom and other types of proceedings; transcribing from shorthand or other recording media; military justice and military legal procedures.

At the higher career levels Legalmen must be able to take dictation at a minimum of 200 words per minute. They learn proper procedures for preparing legal documents, trial records and other official reports. Some Legalmen take on administrative responsibilities—planning, organizing and supervising legal office procedures.

Legalmen acquire a great deal of technical knowledge in order to do their work. The knowledge background provided in training includes:

- Content of various reference books on Navy regulations and legal procedures including the Uniform Code of Military Justice, the Commanding Officer's Non-Judicial Punishment Manual, the Manual for Courts Martial, the Judge Advocate General's Manual and the Legal Assistance Handbook.

- Purpose and use of standard legal reference books including state and federal codes and state and federal reporters and citators (the federal code, for example, is called the "United States Code." It is a collection of all laws enacted by the United States Congress. Reporters and citators are reference books prepared by legal publishing houses.)
- Standard civilian and military justice procedures, including purpose and use of a Uniform Citation System (a systematic way of writing references to cases and reference documents); types of sentences that can be imposed, executed or suspended for particular offenses; types of discharges from the Navy and the consequences of each; requirements for serving subpoenas and delivering other types of legal documents; courtroom procedure; requirements for disposing of trial records.
- Navy personnel regulations and benefits.
- Nature of different types of claims including claims to recover expenses for medical care, property damage claims, disability benefit claims and others.

The skills and knowledge described here do not include all skills and knowledge acquired by Navy Legalmen. The description is intended only to suggest the kinds of things Legalmen learn through experience and study.

## EMPLOYMENT OPPORTUNITY

There are approximately 11,150 men and women performing work in the Yeoman and Legalman ratings, of whom about 9,800 are rated petty officers. Of these petty officers 280 are Yeoman who have converted to the Legalman rating. Opportunities are excellent for qualified applicants.

## ADDITIONAL INFORMATION

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## LITHOGRAPHER *

### NATURE OF THE JOB

Navy printshops are run by Lithographers. These personnel are responsible for production of the large volume of printed material used in Navy activities. Lithographers print service magazines, newspapers and bulletins, training materials, official policy manuals such as personnel and security manuals, forms for a variety of purposes, recruiting materials, and more.

The name Lithographer comes from the old practice of engraving stone to make plates (flat image-bearing surfaces) from which prints could be made on other materials. Navy Lithographers do not use stone, but plate-making is still an important part of their work. In modern printing of publications, metal plates are most commonly used. Images are produced on these plates by a process of photoengraving.

Lithographers operate printing presses. They also do a variety of jobs in preparation for printing. Preparations include: layout design and the writing of specifications for typography (the representation of words in type); it includes copy preparation and proofreading (verifying or "proving" a preliminary copy of the manual to make sure there are no errors); and it often includes photography, film processing, and plate-making. After printing, Lithographers use special equipment to collate, or put in sequence, the printed pages and to bind them into finished publications. Or they may fold certain types of publicatins such as brochures and pamphlets. This finishing work is known as bindery operations..

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Lithographers who work in small printshops may do all of these jobs. Those who work in large shops may specialize. The usual specialties are cameraman, pressman and binderyman.

In planning layout designs, Lithographers determine how much page area the printed matter, or text, will require and allot space for any illustrations. They select appropriate type sizes and styles for the main text and use preprinted letters to set up titles, headlines, or other attention-getting lettering to fit the available space. They mark the manuscript with symbols to guide type-setting or typewriter composition. (Typewriter composition is an alternative to type-setting. The original manuscript is typed to fit the layout plan using a special electric typewriter called a composer.)

Type-setting requires the Lithographer to produce or contract for outside production of "hot type." Hot type are produced by a machine (a linotype, for example) in which hot lead is poured into type molds to form bars of word and space sequences. The bars of type are arranged to reproduce the manuscript in rows of racks within a frame, which are called type forms. The Lithographer makes up the type forms, which may be used directly in letterpress printing. They are inked and paper is pressed on them to pick up the images. Usually a preliminary copy is run first so that errors may be corrected before printing begins.

Type forms may also be used to make metal plates for letterpress printing. This requires the Lithographer to photograph the proof copy. He or she then exposes the negative and etches the image onto a metal plate. Special washes are applied so that only the image will accept ink and be printed. The plates are inserted into the letterpress instead of type forms and printing proceeds in the same way. Metal plates for letterpress printing also may be engraved from negatives of typewriter-composed copy.

Lithographers are also skilled in the newer technique of offset printing. The name "offset" comes from the fact that prints are not made directly from type forms or plates. Plates are made, but the images are off-set from them onto a rubber sheet, or "blanket." The blanket is then placed on a roller in the offset press. Ink is applied, and image is again transferred to the offset cylinder, which rolls over paper as it passes through the press, making the prints.

Photography is an important step in many printing jobs. Lithographers learn to operate the cameras and use related equipment such as lights, filters, and half-tone screens to produce various effects. (Half-tone screens are used to reproduce photographs. A screen is placed between the image and the film, producing dots of varying density relative to the tones or shades (white-to-black) of the original photograph.) Lithographers do their own darkroom work as well. They expose film on plates (sometimes paper, but usually thin aluminum), and develop and process the negatives and positives. (A positive is used for reverse printing. In reverses, the background accepts ink while the image refuses it. This is the technique that produces white lettering on a black or colored background.) Special washes are applied to etch the images onto the plates and sensitize them to accept inks. If plates will not be used right away, they are protected with chemical preservatives.

Binding and finishing operations include paper-cutting, stitching, folding, punching, drilling, perforating, and stapling, as required by the type of finished publication that is desired. Special equipment is generally used for this work.

Finally, Lithographers are responsible for maintenance of much of the machinery and equipment they use. For example, they keep presses free of excess ink and accumulations of oil and dust, etc.; and they adjust timing and alignment as required.

## WORKING CONDITIONS

Lithographers work in a shop-type setting aboard large ships. They are also assigned to any Navy shore facility where offset of letter press printing is done.

### Sea-Shore Rotation

Lithographers spent approximately 10-12 years on "sea duty" during a 20-year period in the Navy. "Sea duty" includes all of the time during which a sailor is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home.

The remaining 8-10 years of a 20-year period in the Navy will be spent on "shore duty," duty at permanent shore locations where the Lithographer will provide support for fleet units.

Since Navy women do not serve aboard combatant ships, women in this rating generally work at shore facilities in the United States and overseas.

## QUALIFICATIONS

Lithographers should have an interest in photography and printing. They should have mechanical aptitude and the ability to work safely with chemicals. Lithographers need good general learning ability, good spelling and grammar, and the ability to solve practical arithmetic problems. Good vision for close work is also important.

No special training or experience is required to qualify for this job. Courses in typing, printing, physics, chemistry, English, and shop mathematics are helpful preparation, although they are not essential to qualify. Experience in lithography (plate-making), printing and photography are also very helpful but not essential.

## TRAINING PROVIDED BY THE NAVY

Lithographers get their training on the job and by independent study of Navy training courses. The skills they learn include the following:

- Fundamentals of page layout, copy preparation and copy-fitting; how to scale, crop, and mark copy for composition, type-setting and cameras; use of standard drafting equipment and composition typewriters.
- Methods of preparing color combination overlays and of preparing copy for line color separation.
- How to read proofs; standard symbols and method for marking errors; how to make corrections.
- Camera operation and film processing, including how to set up and operate cameras and related equipment; how to mix and store chemical solutions used in film processing; how to develop, fix, wash, and dry negatives and positives; how to mask out non-image areas of negatives, clear fogged or filled in areas of negatives and positives, make additions or deletions, and perform stripping.
- How to mix inks.
- Preparation type forms.
- Press operation.
- Bindery operations.
- Maintenance of presses, cameras, darkrooms, plate-making equipment and bindery equipment.

Training provides Lithographers with the knowledge base for developing the more academic side of training which covers such topics as types, uses, and characteristics of film filters, screens, and lighting systems; types and grades of paper; characteristics and uses of inks; color theory, including additive and substractive processes of forming colors; and type sizes and styles. Training also covers safety precautions for working with chemicals and for press operation.

## EMPLOYMENT OPPORTUNITY

There are approximately 400 men and women performing work in the Lithographer rating, of whom about 340 are rated petty officers. Opportunities are available for qualified applicants.

## ADDITIONAL INFORMATION

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## MACHINERY REPAIRMAN *

### NATURE OF THE JOB

Machinery Repairmen are skilled machine tool operators. They make replacement parts and repair or overhaul ship's engine auxiliary equipment such as evaporators, air compressors and pumps. They also work on deck equipment including winches and hoists, condensers, and heat exchange devices. Machinery Repairmen who are assigned to ships frequently operate main propulsion machinery, in addition to performing machine shop and repair duties.

Shop work involves the use of lathes, drill presses, bench grinders, planing tools, milling machines (used for shaping metals, cutting slots, boring holes, etc.), and power hacksaws. Precision measuring instruments and hand tools are also important in shop work. For example, Machinery Repairmen use hand files and chisels, squares, threading dies and taps (instruments for cutting and shaping grooves or threads in metal parts); calipers (small, two-legged instruments that resemble pincers or a compass, used to measure inside and outside diameters and thickness); sine bars (used for measuring angles); and portable electric and pneumatic power tools. In making parts and performing repairs or overhauls, Machinery Repairmen work from written specifications and diagrams. They may also draw their own working diagrams.

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The work of a Machinery Repairman also involves tasks like cutting gears and cutting teeth in gear wheels (called "hobbing"); grinding drills and other machine parts to the desired taper; grinding valves to the proper size; cutting various types of threads on a lathe and by hand; broaching, which means cutting away metal (or plastic) to shape an outside surface or a hole that has been drilled, or formed during molding or by other means. Other tasks include planing or shaping flat surfaces, slots, and dove-tail or angle grooves; grinding surfaces to make them smooth; contour sawing using metal bandsaw attachments on a power tool; engraving brass or other metal and plastic name plates; heat-treating metals; applying metalizers; and conducting hardness tests and dye penetrant tests to check for cracks.

Administrative duties include ordering parts, tools and other working materials. Tools and equipment are inventoried periodically and records maintained. In addition, each shop has a set of technical manuals which describe the theory, testing, operation and repair of machinery and machine tools. Machinery Repairman keep the manuals up to date by adding or changing information, and they recommend changes to procedures in the manuals based on their experience in testing and repairing the equipment.

## WORKING CONDITIONS

Machinery Repairmen are usually assigned to large ships or to naval shipyards and repair bases ashore. They work primarily in a shop type setting. Aboard ship, they may do considerable work in the engine room, as propulsion machinery operators. There is often a very high noise level in the vicinity and the temperature is usually quite warm.

### Sea-Shore Rotation

Machinery Repairmen spend approximately 10-12 year on "sea duty" during a 20-year period in the Navy. "Sea duty" includes all of the time during which a sailor is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home.

The remaining 8-10 years of a 20-year period in the Navy will be spent on "shore duty," duty at permanent shore locations where the Machinery Repairman will provide support for fleet units.

Since Navy women do not serve aboard combatant ships, women in this rating generally work at shore facilities in the United States and overseas.

## QUALIFICATIONS

High aptitude for mechanical work and the ability to use mathematics for practical problem-solving are required to qualify for this job. It is helpful, but not essential, to have school training or experience in basic mathematics or shop mathematics, electricity, mechanical drawing, blueprint reading, foundry work, and, of course, machine shop.

## TRAINING PROVIDED BY THE NAVY

Machinery Repairmen may train on the job, under supervision of experienced personnel, and supplement this training by independent study of Navy training manuals. Candidates may also attend service schools for a program of study combined with work experience.

Training covers basic job skills, including use and care of hand tools; lathe and drill press operation; milling machine and shaping or planing tool operation; use of measuring instruments; shop mathematics; mechanical drawing and blueprint reading. The following list gives some examples of specific skills and knowledge that Machinery Repairmen learn:

- Characteristics and uses of different metals; identification of metals by chip, file, spark, and acid tests; effects of heat on metals; and heat treatment processes. .
- Relationship of machinery results to machine speed and feed.
- Lubrication of machine tools; use of lubricants in cutting threads, reaming, and in drilling by machine.
- Common hand file cuts, file sizes and uses; common chisels and their uses; sizes types, and uses of twist drills and hand reamers.
- Materials and grades; characteristics and uses of abrasive wheels; types of milling cutters, milling configurations and processes; types of planing operations; types of turning operations on a lathe; use and fitting of special purpose machine tool attachments.
- Kinds of gears and their uses; gear milling processes; rules for determining the proper mesh of gear teeth.

- Characteristics and uses of different gasket materials; how to cut and fit gaskets.
- Types and uses of fasteners such as taper pins, dowels, and key fasteners.

Machinery Repairmen also receive training in safety precautions for working with power tools and heavy machinery, with electrical equipment, with chemicals, and with oxyacetalene torch equipment.

## EMPLOYMENT OPPORTUNITY

There are approximately 2,400 men and women performing work in the Machinery Repairman rating, of whom about 1,800 are rated petty officers. Entry opportunities are limited except for highly qualified applicants.

## ADDITIONAL INFORMATION

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# MACHINIST'S MATE *

## NATURE OF THE JOB

Machinist's Mates operate, maintain and repair ship propulsion and auxiliary equipment such as steam propulsion machinery, propellers, pumps, oil purifiers and reduction gears. They also maintain and repair outside machinery such as steering engines and elevators; food preparation and utility equipment; and refrigerating and air conditioning equipment. They may also perform duties in the generation, storage and transfer of some industrial gases.

Machinist's Mates lubricate all engine room, machine shop, refrigerating, air conditioning and gas generating equipment. They use hand tools commonly employed in repairing machinery and perform simple operations on lathes, drill presses and bench grinders. They also use precision measuring instruments such as dial indicators, micrometers, depth gages, thermometers and pressure gages. Some of their work requires that they be able to read and work from simple blueprints and sketches as well as sketch machinery parts.

In the course of their work, Machinist's Mates become familiar with mathematical computations (such as areas, volumes, proportions, decimals and fractions) used in routine shop operations. They also learn common engineering terms; principles of AC and DC electricity governing the operation of electric motors, circuit breakers and control devices; locations and uses of drainage, flushing and fire main systems; and fundamental principles of lubrication, various lubricating systems, and types and uses of lubricants.

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* Each Machinist's Mate is involved in the general work of the Navy as well as in the work of his or her own "rating" or occupation. It is very important for each sailor to understand the general work of the Navy as well as the work of his or her own rating. The first chapter of this manual describes the general work of the Navy.

Administrative duties include inventorying and ordering parts, tools and other working materials. In addition, each shop has a set of technical manuals which describe the theory, operation, maintenance, repair and test of the systems and machinery for which Machinist's Mates are responsible. Machinist's Mates keep the manuals up to date by changing or adding information and they recommend changes to the procedures and techniques in the manuals based on their knowledge and experience in working with the equipment.

## WORKING CONDITIONS

Machinist's Mates are assigned to all types of Navy ships and usually work in the main and auxiliary engine room spaces. The working environment is often hot and noisy.

Ashore, Machinist's Mates work at naval bases, at naval shipyards and at naval repair facilities.

### Sea-Shore Rotation

Machinist's Mates spend approximately 12-14 years on "sea duty" during a 20-year period in the Navy. "Sea duty" includes all of the time during which a sailor is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home.

The remaining 6-8 years of a 20-year period in the Navy will be spent on "shore duty," duty at permanent shore locations where the Machinist's Mate will provide support for fleet units.

Since Navy women do not serve aboard combatant ships, women in this rating generally work at shore facilities in the United States and overseas.

## QUALIFICATIONS

Machinist's Mates must have good mechanical aptitude and the ability to work with numbers. Courses in mathematics, machine shop, electricity and physics, and experience in garage, power plant or machine shop are helpful but are not required.

## TRAINING PROVIDED BY THE NAVY

Machinist's Mates acquire their skills through attendance at Navy service schools or through on-the-job training coupled with individual study of Navy correspondence courses and training manuals.

Training covers such topics as:

- Principal machinery parts and basic machinery operation
- Main propulsion and auxiliary machinery
- Principles of lubrication
- Mathematics used in shop operations
- Engineering terms and expressions
- How to test various machines and systems
- Principles of electricity
- Principles of gas production, refrigeration and air conditioning
- Use of drainage, flushing and fire main systems.

## EMPLOYMENT OPPORTUNITY

There are approximately 22,400 men and women performing work in the Machinist's Mate rating, of whom about 19,200 are rated petty officers. Opportunities exist for qualified applicants.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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How the Navy Hires Page 35
Navy Pay Page 40
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## MASTER-AT-ARMS *

### NATURE OF THE JOB

Masters-At-Arms perform general supervisory and security duties aboard ships and at naval shore facilities in the United States and overseas. They generally work for the Executive Officer of a ship or shore activity and assist in maintaining law and order and general military discipline. They ensure that general orders and directives are carried out in an orderly fashion and ensure that routine regulations, such as "no smoking" restrictions or uniform requirements, are enforced. Aboard ship, Masters-At-Arms may carry out such duties as ensuring pay lines and mess lines are orderly and that personnel traffic is routed around areas of the ship where cleaning or maintenance activities are in progress. At shore facilities, Masters-At-Arms are frequently assigned to barracks where they supervise cleaning efforts and fire and security watches, and generally maintain good order and discipline.

Masters-At-Arms also carry out investigative and interrogative assignments and participate in correctional and rehabilitation programs. They organize and train personnel assigned to police duties and maintain liaison with civilian law enforcement agencies. They also assist in controlling vehicular traffic at naval shore facilities.

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* Each Master-At-Arms is involved in some of the general work of the Navy as well as the work of his or her own "rating" or occupation. It is very important for each sailor to understand the general work of the Navy as well as the work of his or her own rating. The first chapter of this manual describes the general work of the Navy.

## WORKING CONDITIONS

Masters-At-Arms are generally assigned to ships that have crews of 350 or more enlisted personnel, and to naval shore activities in the United States and overseas. Some of their work is performed out of doors in weather good or bad, while other tasks are performed in offices and other indoor settings.

### Sea-Shore Rotation

Masters-At-Arms rotate between "sea duty" and "shore duty," with a normal tour being three years in length. "Sea duty" includes all of the time during which a sailor is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home.

Since Navy women do not serve aboard combatant ships, women in this rating generally work at shore facilities in the United States and overseas.

## QUALIFICATIONS

Masters-At-Arms are selected from among enlisted personnel who have met all of the eligibility requirements for petty officer, first class, in some other Navy rating. A high school diploma or equivalent is required and candidates must be capable of assuming significant responsibility. Candidates must also have the ability to express themselves clearly, both orally and in writing, and must be able to deal with people effectively.

## TRAINING PROVIDED BY THE NAVY

Since Masters-At-Arms are selected from among experienced personnel, they will normally have acquired experience in related areas such as the conduct of shore patrol activities. Advanced schooling is available for selected personnel. Courses cover such subjects as:

- How to conduct physical security inspections
- How to conduct searches of persons, vehicles and places
- How to collect and preserve physical evidence and how to obtain and record testimonial evidence
- How to prepare police reports and how to testify at legal proceedings
- Traffic control procedures
- Identification of drugs and drug offenders
- Proficiency in small arms
- Emergency first-aid procedures.

## EMPLOYMENT OPPORTUNITY

There are approximately 600 Navy men and women performing work in the Master-At-Arms rating, all of whom are rated petty officers. Opportunities exist for qualified applicants.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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## MESS MANAGEMENT SPECIALIST*

### NATURE OF THE JOB

Mess Management Specialists purchase, prepare and serve food in Navy officer and enlisted eating places (called "messes") aboard ship and at shore stations in the United States and overseas. They prepare and cook soups, vegetables, meats, seafoods, fruits, salads and desserts; bake various kinds of breads, pies and cakes; and cut all types of meats. Mess Management Specialists prepare properly balanced menus; operate and maintain kitchen ranges, ovens and mechanical apparatus used in preparing food; and operate and maintain food storage facilities. They also estimate food requirements, prepare requisitions and keep records and reports of all transactions.

Mess Management Specialists learn proper methods of storing meats, poultry, seafoods, vegetables and other perishable and nonperishable foods; and sanitary methods used in cleaning kitchen ranges, food lockers, refrigerators, kitchen utensils, kitchens and dining rooms. They also learn methods for preparing and storing dishes and cooking utensils and proper methods of table service.

Mess Management Specialists also assist in the upkeep of Navy public quarters and officer quarters aboard ship and ashore. They maintain and store linen supplies and cleaning materials and perform general cleaning and maintenance tasks.

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* Each Mess Management Specialist is involved in the general work of the Navy as well as in the work of his or her own "rating" or occupation. It is very important for each sailor to understand the general work of the Navy as well as the work of his or her own rating. The first chapter of this manual describes the general work of the Navy.

## WORKING CONDITIONS

Mess Management Specialists are assigned to all types of ships and shore activities in the United States and overseas.

### Sea-Shore Rotation

Mess Management Specialists spend approximately 12-14 years on "sea duty" during a 20-year period in the Navy. "Sea duty" includes all of the time during which a sailor is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home.

The remaining 6-8 years of a 20-year period in the Navy will be spent on "shore duty," duty at permanent shore locations where the Mess Management Specialist will provide support for fleet units.

Since Navy women do not serve aboard combatant ships, women in this rating generally work at shore facilities in the United States and overseas.

## QUALIFICATIONS

Mess Management Specialists must have an interest in food preparation, high standards of honesty and cleanliness, and the ability to use numbers in solving practical problems. Courses in arithmetic and home economics, and experience in cooking or baking are helpful but not required.

## TRAINING PROVIDED BY THE NAVY

Mess Management Specialists acquire their skills through on-the-job training and self-study of Navy training manuals and correspondence courses, and through attendance at service schools. Training covers such topics as:

- Methods for preparing soups, meats, poultry, seafoods, vegetables, fruits and desserts
- Methods for baking various breads, pies and cakes
- Professional meat-cutting techniques
- Preparation of well-balanced and nutritious menus
- Methods and sanitary precautions for storing various foodstuffs
- Correct table service
- Methods for estimating and purchasing food including methods for determining seasonal variations in the price of foods
- Operation and maintenance of food storage and preparation equipment.

## EMPLOYMENT OPPORTUNITY

There are approximately 19,000 men and women performing work in the Mess Management Specialist rating, of whom about 13,000 are rated petty officers. Opportunities exist for qualified applicants.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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# MINEMAN *

## NATURE OF THE JOB

Minemen are weapons specialists who handle underwater explosive devices, or mines. These personnel assemble mine components, conduct tests to ensure that mines will work properly, and make repairs. They are responsible also for mine storage and the loading of mines for transport.

Basically, a mine consists of explosive material in a metal protective case, with a mechanism to cause the explosive material to fire. Mine firing mechanisms usually are sophisticated electronic devices with various accessory parts. Firing mechanisms may be activated by water pressure when the mine reaches a certain depth, by pressure change that occurs when a ship passes over, or by a combination of the two water pressure effects. The elements that detect water pressure changes are called "hydrostatic" devices. Some firing mechanisms have counters associated with them so they will not fire until, say, the fifteenth ship passes over. Some have timers so they will fire a week or a month, for example, after the mine is placed in the water. Today mine firing mechanisms are most often activated by changes in the electromagnetic field caused by the passage of ships. Most firing mechanisms have "sterilizers" associated with them—units that automatically degrade the firing mechanism after a certain period of time so that it will not activate the mine. Sometimes, however, mines may be brought out of the water for deactivation, or divers may be sent down to do the job.

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* Each Mineman is involved in the general work of the Navy as well as in the work of his or her own "rating" or occupation. It is very important for each sailor to understand the general work of the Navy as well as the work of his or her own rating. The first chapter of this manual describes the general work of the Navy.

Minemen inspect mine cases and ready them for assembly. They load explosives into mine cases. They assemble, test, and repair firing mechanisms and accessories including hydrostatic devices, batteries, actuation counters, control boxes, relays, circuit breakers, and clock delays. They install auxiliary safety devices to prevent accidental firing.

Assembly and maintenance work involves welding, machine tooling, mechanical adjustments, installation of electrical and electronic parts, and battery charging and installation. For assembly and maintenance tasks, minemen use standard hand tools (wrenches, pliers, screwdrivers, etc.), thread cutting devices, mechanical measuring devices, soldering equipment, portable power tools, and bench tools such as grinders and drill presses. Several kinds of testing devices are used, including electrical, hydrostatic, and vacuum tube devices. In addition, Minemen often work from mechanical drawings and wiring diagrams. They also learn to interpret these aids to draw working diagrams of their own.

Mines may be loaded onto surface ships, submarines, or aircraft for "planting" or placement in the water. Mines to be planted by aircraft carry parachute packs, which Minemen are responsible for maintaining, installing, and inspecting. Minemen develop plans for storage or for loading mines and mine components onto aircraft or vessels, and they regularly check temperatures in storage areas. Minemen also instruct other personnel in procedures for safe handling and storage of mines.

Administrative duties include ordering parts, tools and other working materials. Tools and equipment are inventoried periodically and records maintained. In addition, each shop has a set of technical manuals which describe the theory, testing, operation and repair of mines and mine equipment. Minemen keep the manuals up to date by adding or changing information, and they recommend changes to procedures in the manuals based on their experience in testing and repairing the equipment.

## WORKING CONDITIONS

Minemen are generally assigned to carriers, mobile mine detachments and to shore facilities in the United States and overseas. Their work is generally conducted in a shop-type setting although they do perform some of their work out of doors when they handle, transport and test mines and mine equipment.

### Sea-Shore Rotation

Minemen spend approximately 10-12 year on "sea duty" during a 20-year period in the Navy. "Sea duty" includes all of the time during which a sailor is assigned to a fleet unit (a ship, squadron or fleet staff) or, in this case, a mobile mine detachment. Such detachments are located ashore, but are considered to be "sea duty" since they are frequently on the move performing their work aboard various ships and at various locations. The term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home.

The remaining 8-10 years of a 20-year period in the Navy will be spent on "shore duty," duty at permanent shore locations where the Mineman will provide support for fleet units.

Since Navy women do not serve aboard combatant ships, women in this rating generally work at shore facilities in the United States and overseas.

## QUALIFICATIONS

Minemen need good general learning ability and a high degree of mathematical ability. The work also requires careful attention to details and excellent manual dexterity.

School courses in electricity, mahine shop, welding, mechanical drawing, and mathematics including shop mathematics, are all useful preparations for the job. Previous work experience involving electricity, use of machine tools, and welding also is helpful. However, previous training and experience are not essential to qualify.

## TRAINING PROVIDED BY THE NAVY

Candidates are trained in service schools. The following list suggests the kinds of skills and knowledge Minemen learn in the Navy:

- Mine theory, including sequence of operations from planting to firing or sterilization of mines.
- Fundamentals of alternating and direct current electricity with elementary applied mathematics, including: terminology; electrical units of measure; electrical circuits; purposes and principles of galvanic cells, batteries, induction-type relays, and fuses; effects of capacitance, inductance, resistance, and reactance on series and parallel circuits; theory and uses of magnetic circuits; uses of electronic components of mine firing mechanisms and related circuits.
- Electrical testing and repair procedures including hookups, grounding, circuit tracing, etc.
- Basic physical laws applied to mines and mine operation, including: effects of underwater sound transmission, heat, inertia, and gravity on mine operations; special precautions to be observed with mines under extreme climate conditions.

- Explosives used in underwater mines, including: explosive limits, compatibility of different explosive materials and explosive deterioration and decomposition.
- Use of hand and bench tools in mine assembly and repair.
- Interpretation and preparation of mechanical drawings, wiring diagrams, and logic circuit diagrams.
- Shop and underwater testing procedures; operation and maintenance of test equipment.
- Mine handling, storage, and placement procedures including: methods of planting; procedures for installing mines in aircraft and submarines; preparation for shipping and storage; and inspection and upkeep of storage areas.

## EMPLOYMENT OPPORTUNITY

There are approximately 500 men and women performing work in the Mineman rating, of whom about 400 are rated petty officers. Entry opportunities are limited except for highly qualified applicants.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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# MISSILE TECHNICIAN *

## NATURE OF THE JOB

Missile Technicians assemble, maintain and repair missiles carried by Navy submarines. In addition, they maintain the specialized equipment used in handling, testing and repairing missiles. They are also responsible for the safe loading, unloading and storage of missiles, missile components and related equipment. Missile components, and the testing and handling equipment, are primarily electrical and electronic systems. However, mechanical, hydraulic and pneumatic units are involved in launcher systems, fire control systems and in missile flight control systems.

Missile Technicians place missile components in special containers for transport and storage, putting in packing materials and dessicants (which prevent moisture from forming inside the containers). They use nitrogen or low air pressure techniques to pressurize containers. (Pressurization is necessary to protect finely adjusted and sensitive missile components from dust and corrosion and to reduce the disturbing effects of movement.) They check temperatures and other conditions in storage areas. They "vent" or release pressure from containers, unpack components and assemble them.

Testing, maintenance and repair work requires Missile Technicians to use instruments such as voltmeters, vacuum tube voltmeters, ammeters, ohmmeters, oscilloscopes, tube and transistor testers and battery test procedures. These help the technicians make sure that missile systems are operating

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* Each Missile Technician is involved in the general work of the Navy as well as in the work of his or her own "rating" or occupation. It is very important for each sailor to understand the general work of the Navy as well as the work of his or her own rating. The first chapter of this manual describes the general work of the Navy.

properly. The instruments give signals that indicate the location of any components, circuits, parts, etc., that need to be replaced or repaired. Then using circuit diagrams, mechanical drawings and written specifications to guide them, the Technicians can take apart systems and repair or remove and replace the defective units.

Missile Technicians test and repair electro-hydraulic systems associated with missile guidance and control; they check power supplies and regulators; they replace electronic packages, circuit components, and fuses and resolder electrical connections. They evaluate gyroscopes and gyro-control and autopilot systems, which guide missiles to their targets. (A gyroscope is a spinning device that stabilizes a missile on its course. The spinning offers resistance to forces that would change the direction of the missile. A gyro-control system controls the axis of the spin and thus the direction of the missile.)

Administrative duties include ordering parts, tools and other working materials. Tools and equipment are inventoried periodically and records maintained. Missile Technicians also maintain records on missile systems—histories of system performance, repairs made and current status. In addition, each shop has a set of technical manuals which describe the theory, testing, operation and repair of armament systems in detail. Missile technicians keep the manuals up to date by adding or changing information, and they recommend changes to procedures in the manuals based on their experience in testing and repairing the equipment.

## WORKING CONDITIONS

Missile Technicians work aboard missile-carrying submarines and submarine tenders (surface ships that go out to provide maintenance, repair and other support services to submarines at sea). Ashore they are assigned to missile assembly plants and repair facilities.

### Sea-Shore Rotation

Missile Technicians spend approximately 12-14 years on "sea duty" during a 20-year period in the Navy. "Sea duty" includes all of the times during which a sailor is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home.

The remaining 6-8 years of a 20-year period in the Navy will be spent on "shore duty," duty at permanent shore locations where the Missile Technician will provide support for fleet units.

Since Navy women do not serve aboard combatant ships, women in this rating generally work at shore facilities in the United States and overseas.

## QUALIFICATIONS

Candidates must have good general learning ability, normal hearing and normal vision. It is helpful to have experience in electrical, electronic, hydraulic and mechanical work. Courses in any of these areas also would be helpful. However, no experience or training before joining the Navy is required to qualify.

## TRAINING PROVIDED BY THE NAVY

Missile Technicians learn on the job from experienced personnel, study training manuals on their own, and attend service schools for training. The basic training covers principles of electricity and electronics, principles of hydraulics and principles of mechanics and missile systems. Specific subjects include:

- How to prepare missiles and missile components for inspection and assembly
- How to load, unload and store missiles; standards for storage environment and how to check environmental conditions
- How to prepare missiles and missile components for inspection and assembly
- Principles of motors and generators; how to install and remove rocket motor starters or ignition inverters; motor and generator repair procedures
- Application of the laws of magnetism to motors and generators
- Theory and operation of missile flight control systems including mechanical, hydraulic and pneumatic systems; functions of pressure gages, check valves, pressure-reducing valves and other kinds of valves in hydraulic and pneumatic systems; functions of restrictors, actuators, gaskets, O-rings, manifolds, pressure and flow regulators, filters and piston-type pumps in hydraulic and pneumatic systems
- Fundamentals of missile propulsion, guidance and stabilization

- How to calculate current, voltage, power and resistance in direct current circuits; how to calculate current, phase angle and resonance in alternating current circuits
- Functions of and how to install resistors, solenoids, thermostats, inductors, capacitors, fuses, switches and transformers in electrical circuits; how to install such devices
- How to operate missile testing instruments such as voltmeters, ohmmeters, ammeters and oscilloscopes
- How to locate and analyze problems in missiles, missile components and test equipment
- Safety precautions for working with potentially dangerous equipment and materials (such as "live" electrical conductors, radioactive and cathode ray tubes and pressurized units); first-aid techniques for reviving a person unconscious from electrical shock; techniques for rescuing a person in contact with a live electrical conductor, and for treating electrical and chemical burns.

This list does not include everything a person might learn as a Navy Missile Technician. The list is provided just to show the kinds of skills and knowledge these Technicians gain through study and work experience.

## EMPLOYMENT OPPORTUNITY

There are approximately 1,250 men and women performing work in the Missile Technician rating, of whom about 1,240 are rated petty officers. Shortages exist and opportunities are excellent for qualified applicants.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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# MOLDER*

## NATURE OF THE JOB

Navy Molders operate foundries -- shops in which metals are formed into equipment parts. Molders make the forms, or molds, which shape the parts, and they make special pieces called "cores", which are inserted into molds to make holes of various shapes needed in some kinds of parts. Molders make the actual parts as well, by melting metals, pouring liquid metal into molds, and freeing the hardened metal shapes from their molds. These part shapes are called "rough castings". Rough castings are turned into finished parts by Machinery Repairmen in Navy machine shops.

Another job of Molders is to replace the metal lining of bearings. This process is called "rebabbitting" because of the special, antifriction metal that is used, which was invented by a man named Babbitt.

Molds are made from sands mixed with various bonding materials. Before a mold is made, the Molder calculates the weight of the casting it will be used to produce. The Molder also conditions the sand to make sure it has desired characteristics in terms of grain size and shape, clay content, moisture content, permeability, green strength (strength before firing or baking), and surface hardness. If a mold is to be made from a previous casting, that casting must be cleaned first. Molds also are constructed from patterns.

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* Each Molder is involved in some of the general work of the Navy as well as in the work of his own "rating" or occupation. It is very important for each sailor to understand the general work of the Navy as well as the work of his own rating. The first chapter of this manual describes the general work of the Navy.

Sometimes "foundry facings" are used in mold-making. A foundry facing is a powder that gives a smooth surface to castings. Foundry facings may be made of sands, sea coal, silica, flour, and other compounds. They may be applied to the mold surface that will be in contact with the metal, or they may be mixed with sand in making the mold.

Sand is also used in making cores, along with a special oil and compounds. The cores are shaped and baked in ovens. Molders light these ovens and make sure that correct temperatures are maintained.

Molders identify metals and alloys, heat-treat them, and perform tests for hardness. They operate the furnaces used to melt metals for casting and pour the castings. They clean mold materials from finished castings using chipping guns, sandblast equipment, grinders, and tumblers.

Other special tools used by Molders include riddles (seives for separating coarser and finer materials) to condition sand, rammers to compact materials, trowels, slicks (flat paddles, usually made of steel, for smoothing), vent wires (to provide channels in a mold through which air may escape), and files.

Molders maintain the hand and power tools they use. They are also responsible for furnace maintenance, which involves, for example, cleaning out furnace bottoms and replacing heat-resistant linings, called refractory linings.

## WORKING CONDITIONS

Molders work at naval shipyards and at other shore-based repair and manufacturing facilities where foundries are operated. They also may be assigned to repair ships and tenders. The shops where Molders work are frequently very warm.

### Sea-Shore Rotation

Molders spend approximately 12-14 years on "sea duty" during a 20-year period in the Navy. "Sea duty" includes all of the time during which a sailor is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home, but rather time during which there will be some periods away from home.

The remaining 6-8 years of a 20-year period in the Navy will be spent on "shore duty", duty at permanent shore locations where the Molder will provide support for fleet units.

## QUALIFICATIONS

Molders need a high degree of mechanical aptitude, along with good general learning ability. They also need to be physically strong and have an interest in work with hand and power tools.

School courses or experience in foundry work, machine shop, and practical mathematics would be helpful preparation for this job. However, no previous training or experience is required to qualify for this job.

## TRAINING PROVIDED BY THE NAVY

Molders may get their training on the job, under supervision of experienced personnel. On-the-job training is supplemented by individual study of training manuals provided by the Navy. Molders may also receive training in service schools. The skills and knowledge that Molders acquire include the following:

- Use and care of standard hand and power tools for foundry work.
- Blueprint reading and mechanical drawing.
- Shop mathematics, including: how to calculate the pressures that will be exerted on molds and, thus, the mold strength that will be necessary; how to calculate the proper amount of ore (the "furnace charge") that should be put in the cast iron furnace for producing non-iron alloys and steel.
- Mold-making procedures and principles, including: sand-conditioning techniques; characteristics and uses of bonding substances (to hold particles of basic mold material together); contraction of metals from liquid to solid state and its implications for molding-making and casting; construction of molds from patterns; construction and use of mold supports, "risers" (channels in a mold to allow air to escape), "gates" (channels through which the molten metal flows into molds); procedures for making molds directly from castings.
- Procedures for making dry sand and special mixture cores; use of sodium silicate for binding core materials; procedures for making $CO_2$ process cores and for baking cores; reactions of sodium silicate binders with $CO_2$ gas and heat; gassing time versus baking

time; effect of the viscosity (thickness, stickiness) of core mixture on core strength when a gassing or a baking process is used; operation and maintenance of baking ovens.

- Knowledge of metals and alloys and casting procedures, including: how to identify ferrous and nonferrous metals by chip, file, spark, and acid test; procedures for testing metal hardness; methods of controlling solidification of liquid metal; types and effects of gases absorbed by metals; methods of purging gases from metals and preventing metals from absorbing gases; procedures for melting metals; theory and methods of annealing (a heat process used to reduce stress problems such as brittleness); tempering (a heat process used to bring metals to a desired degree of toughness or hardness); homogenizing (blending and emulsifying molten metal to ensure consistency in the characteristics of the parts made from it); and other techniques of giving metals the properties needed for different purposes.
- Operation and maintenance of oil-fired, indirect arc, and resistor furnaces, including how to load, clean, and reline furnaces.

The work of Molders requires them to give considerable attention to safety because of the equipment and materials they use. Safety training covers precautions when lighting and shutting down gas and oil furnaces, when pouring molten metals, when storing and handling compressed gas cylinders, and when engaged in other potentially hazardous activities.

## EMPLOYMENT OPPORTUNITY

There are approximately 215 personnel performing work in the Molder rating, of whom about 160 are rated petty officers. Opportunities are good for qualified applicants.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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# MUSICIAN*

## NATURE OF THE JOB

Navy Musicians play in official Navy unit bands and in special groups such as jazz bands, dance bands, and small ensembles (trios, quartets, quintets, etc.). They give concerts and provide music for military ceremonies, religious services, parades, and social occasions such as receptions and dances. They play for all kinds of people -- Navy personnel and their families, the general public, representatives of foreign nations, and others. They perform for television and radio productions as well as before "live audiences".

Official unit bands usually do not include stringed instruments. All Navy Musicians must be able to play at least one brass, woodwind, or percussion instrument (percussion includes piano). Other instruments may be used for special numbers or in performances by special ensembles such as the country and western group or the rock group with the main Navy band stationed at Washington, D.C. People who have singing ability may sometimes perform as vocalists, in addition to playing their regular instruments.

Performing is only part of Musicians' work. They must practice individually and in group sessions. Typically, they practice every day. They also study harmony, rhythms, musical notation (symbols and forms used in writing music), and other topics of music theory. They train their ears by listening to music and doing exercises like identifying chord progressions by sound. They arrange or transcribe music, which means they rewrite a piece of music for an instrument, voice, or ensemble different from the one for which the music was originally written. (For example, a Musician might take a gospel tume and rewrite it to be played by a band instead of sung.) They transpose music, or rewrite it in a higher or lower key. They transpose simple music on sight as well -- looking at the music written in one key and playing it in another.

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* Each Musician is involved in some of the general work of the Navy as well as in the work of his or her own "rating" or occupation. It is very important for each sailor to understand the general work of the Navy as well as the work of his or her own rating. The first chapter of this manual describes the general work of the Navy.

Some Musicians specialize in conducting and all learn the principles of conducting so they can respond well to the conductor. They learn to follow a drum major's baton signals for playing in marching bands.

Musicians care for their own instruments. They tune their instruments, clean and polish them. Woodwind players trim and install new reeds; brass players oil valves and slides of their instruments; percussionists adjust drum heads. They also take care of support functions for their own group, like typing, ordering supplies, maintenance of music libraries, etc.

## WORKING CONDITIONS

Musicians are assigned to shore stations within the United States. The main band is at Washington, D.C., and there are 15 other units around the nation. The job may require travel, including some overseas travel. There are many opportunities for individual Musicians to perform for small independent musical organizations made up of amateurs as an off-duty activity.

### Sea-Shore Rotation

Musicians spend approximately 6-8 years on "sea duty" during a 20-year period in the Navy. "Sea duty" includes all of the time during which a sailor is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home, but rather time during which there will be some periods away from home.

The remaining 12-14 years of a 20-year period in the Navy will be spent on "shore duty", duty at permanent shore locations.

Since Navy women do not serve aboard combatant ships, women in this rating generally work at shore facilities in the United States and overseas.

## QUALIFICATIONS

People interested in becoming Navy Musicians must show musical talent and must already be able to play a standard band or orchestral instrument. Candidates are selected based on musical experience and on performance in tryouts held at the U.S. Naval School of Music in Little Creek, Virginia, or at the U.S. Naval Training Centers at San Diego or at Great Lakes. As a rule, three or four years of instrumental music in high school are enough for talented people to qualify to be a Musician in the Navy.

## TRAINING PROVIDED BY THE NAVY

Musicians receive their fundamental training at the U.S. Naval School of Music. Training includes private instrumental instruction, ear training and sight singing, music theory, solo and ensemble performing, conducting instrumentation, and arranging. The following are examples of specific skills and knowledge covered in training for Navy Musicians:

- Nature of sound.
- Notation (symbols and formats used in writing down music).
- Meter (the division of musical compositions into beat or time units), scales, intervals (pitch relationships between tones), and forms in music (patterned arrangements of musical ideas -- for example, sonata form, rondo, fugue).
- Pitches, clefs, and ranges of musical instruments.
- Harmony, including how to identify and play major, minor, diminished, and augmented triads in root position and in all inversions (a triad is a three-note chord; in root position, the base note of the triad identifies the key); how to harmonize melodies in four parts; how to interpret chord symbols used in modern dance music; how to analyze and identify all chords from piano "lead sheets" using alphabetical chord symbols (so that the Musician can read chord symbols from piano music and play the chords on his/her instrument).
- Ear training, including identification by hearing only, of chord progressions in popular music; practice in writing down the melody of a song or other composition while listening to it played with other parts; practice in singing from memory.
- Performing from memory all major and minor scales and arpeggios, simple intervals, grace notes, assigned parts of the National Anthem and honors music (honors music is special music for military

ceremonies); for dance band instrumentalists, performing from memory 10 standard dance tunes and one solo; for non-dance band instrumentalists performing from memory two solos with accompaniment.

- Performing at sight technical exercises, first parts (lead parts or melodies) of instrumental ensemble music in the band repertory.
- For drummers, performing from memory all basic strokes, rhythm patterns including Latin and rock rhythms, and all major and minor scales and arpeggios on chromatic bells, marimba or xylophone.
- Transposing elementary music one whole tone higher and lower, on sight.
- Instrumentation and arranging including techniques of writing scores for traditional and folk songs or melodies and popular songs; types of band scoring.
- How to form and maneuver a marching band; meaning of drum major's baton signals.
- Instrument tuning and maintenance.
- Preparation of musical programs for radio and television, for public performance, and for ceremonies.

## EMPLOYMENT OPPORTUNITY

There are approximately 1,300 men and women performing work in the Musician rating, of whom about 1,000 are rated petty officers. Entry opportunities are limited except for highly qualified applicants.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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# NAVY COUNSELOR *

## NATURE OF THE JOB

Navy Counselors offer vocational guidance on an individual as well as group basis to Navy personnel aboard ships and at shore facilities, and to civilian personnel who are interested in or considering enlistment in the Navy. They collect, organize and analyze information about individuals by reviewing records and test results and by conducting personal interviews. They appraise individuals as to their interests, aptitudes, abilities and personality characteristics and advise them accordingly. Navy Counselors prepare and deliver talks and assist in organizing and implementing career motivation programs. While assigned to Navy recruiting offices, they establish and maintain liaison with local communications media. Finally, Navy Counselors actually recruit civilian personnel into the Navy.

## WORKING CONDITIONS

Navy Counselors generally work in office settings aboard ships that have 350 or more enlisted personnel assigned, and at naval shore activities. Ashore, they are also assigned to Navy recruiting offices throughout the United States.

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* Each Navy Counselor is involved in some of the general work of the Navy as well as in the work of his or her own "rating" or occupation. It is very important for each sailor to understand the general work of the Navy as well as the work of his or her own rating. The first chapter of this manual describes the general work of the Navy.

## Sea-Shore Rotation

Navy Counselors rotate between "sea duty" and "shore duty," with a normal tour being three years in length. "Sea duty" includes all of the time during which a sailor is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home.

Since Navy women do not serve aboard combatant ships, women in this rating generally work at shore facilities in the United States and overseas.

## QUALIFICATIONS

Navy Counselors are selected from among enlisted personnel who have met all of the eligibility requirements for petty officer, first class, in some other Navy rating. Candidates must have good learning ability, the ability to communicate effectively, and the ability to win the confidence of those personnel seeking counseling services. They must also be able to establish liaison with community and news media representatives.

## TRAINING PROVIDED BY THE NAVY

Navy Counselors are selected from among experienced personnel who normally have acquired some recruiting or career counseling experience. Advanced schooling is available for selected personnel. It covers such subjects as:

- Recruiting programs, procedures and techniques
- Career information and counseling procedures and techniques
- Navy occupations and their relationships to civilian jobs
- The use of vocational information materials
- Navy occupational analysis techniques.

## EMPLOYMENT OPPORTUNITY

There are approximately 950 Navy men and women performing work in the Navy Counselor rating, all of whom are rated petty officers. Opportunities exist for qualified applicants.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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# OCEAN SYSTEMS TECHNICIAN *

## NATURE OF THE JOB

Ocean Systems Technicians operate special electronic equipment to interpret and document oceanographic data. Much of the data they collect relates to the depth and composition of the ocean floor and to the manner in which sound travels through water. Ocean Systems Technicians interpret and report all significant data. They also operate electronic support equipment such as tape recorders.

Ocean Systems Technicians prepare and maintain visual displays of the data they collect and convert the data they collect into formats which permit statistical studies.

In performing their work, Ocean Systems Technicians use a variety of hand tools and electronic test equipment. They learn the proper use of such equipment as well as procedures and techniques for maintenance, repair and test of the electronic equipment they use for data collection.

Administrative duties include inventorying and ordering spare parts. tools and other working materials. Ocean Systems Technicians also have a set of technical manuals which describe the theory, operation, maintenance repair and test of their electronic equipment. Ocean System Technicians keep these manuals up to date by adding or changing information and recommend changes to procedures in the manuals based on their experience in working with the equipment.

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[*] Each Ocean Systems Technician is involved in the general work of the Navy as well as the work of his or her own "rating" or occupation. It is very important for each sailor to understand the general work of the Navy as well as the work of his or her own rating. The first chapter of this manual describes the general work of the Navy.

## WORKING CONDITIONS

Ocean Systems Technicians are assigned to various ships and to shore stations in the United States and overseas.

### Sea-Shore Rotation

Ocean Systems Technicians spend approximately 10-12 years on "sea duty" during a 20-year period in the Navy. "Sea duty" includes all of the time during which a sailor is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will some periods away from home.

The remaining 8-10 years of a 20-year period in the Navy will be spent on "shore duty," duty at permanent shore locations where the Ocean Systems Technician will provide support for fleet units.

Since Navy women do not serve aboard combatant ships, women in this rating generally work at shore facilities in the United States and overseas.

## QUALIFICATIONS

Ocean Systems Technicians must have above average learning ability; normal hearing, vision and color perception; ability to perform detailed and sometimes repetitive work; ability to work with numbers; ability to work harmoniously with others; and must be qualified for a security clearance. Courses in algebra, physics and electricity, and experience in electrical and electronic trades are helpful but not required.

## TRAINING PROVIDED BY THE NAVY

Ocean Systems Technicians acquire their skills by completing Fundamental Electricity and Electronics Training and Basic Oceans Systems Technician Training. Topics covered include:

- Physics of sound, including underwater sound
- Variations in physical properties of water
- Underwater sound transmission
- Basic electrical laws including elementary DC and AC electricity
- Theory and use of vacuum tubes
- Principles of mathematics as applied to the special electronic equipment used in their work

- Use of hand tools and electronic test equipment
- Safety precautions and first aid.

## EMPLOYMENT OPPORTUNITY

There are approximately 1,050 men and women performing work in the Ocean Systems Technician rating, of whom about 775 are rated petty officers. Opportunities exist for qualified applicants.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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# OPERATIONS SPECIALIST *

## NATURE OF THE JOB

Operations Specialists operate radar, navigation and communications equipment in the Combat Information Center or on the bridge on board ship. The Combat Information Center may be thought of as the room or space on a ship where the air, surface and underwater tactical situation is plotted, observed and communicated to the Captain and other important personnel on the ship. Friendly ships, aircraft and submarines are plotted on radar scopes, on charts and on vertical status boards by Operations Specialists. Their movements are dictated by operational plans and Operations Specialists compare their movements (including the movement of their own ship) with existing plans and orders. They also plot ships, aircraft and submarines of unfriendly nations and communicate information on their positions and movements to the Captain and other personnel. Operations Specialists communicate with other ships and aircraft as well as with other department of their own ship. They follow general communications plans which apply to the Navy's ships in general, and to special operations.

The most significant work performed by Operations Specialists is that of operating radar consoles. From the radar scopes and the various displays available on them, Operations Specialists detect and track ships, aircraft and missiles; determine their distance, bearing or altitude; distinguish between ships, aircraft or missiles and natural objects or disturbances; identify ships and aircraft, provide data for navigation; plot tracks for air and surface targets; and work as part of search and rescue teams:

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[*] Each Operations Specialist is involved in the general work of the Navy as well as in the work of his or her own "rating" or occupation. It is very important for each sailor to understand the general work of the Navy as well as the work of his or her own rating. The first chapter of this manual describes the general work of the Navy.

## WORKING CONDITIONS

Operations Specialists are assigned to all types of Navy ships. Ashore, they are assigned to schools, to naval bases and to naval stations. Their work is generally performed in fully enclosed spaces, dimly lit except for consoles and status boards.

### Sea-Shore Rotation

Operations Specialists spend approximately 12-14 years on "sea duty" during a 20-year period in the Navy. "Sea duty" includes all of the time during which a sailor is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home.

The remaining 6-8 years of a 20-year period in the Navy will be spent on "shore duty," duty at permanent shore locations where the Operations Specialist will provide support for fleet units.

Since Navy women do not serve aboard combatant ships, women in this rating generally work at shore facilities in the United States and overseas.

## QUALIFICATIONS

Operations Specialists must have good command of practical arithmetic, good vision and hearing, a clear speaking voice, mental alertness and the ability to concentrate.

## TRAINING PROVIDED BY THE NAVY

Operations Specialists acquire their skills through attendance at Navy service schools and through on-the-job training. Training covers such subjects as:

- Radar equipment operation and repair
- Radiotelephone communications
- Electronic countermeasure equipment
- Navigational plotting
- Combat Information Center procedures.

## EMPLOYMENT OPPORTUNITY

There are approximately 6,700 men and women performing work in the Operations Specialist rating, of whom about 4,500 are rated petty officers. Opportunities exist for qualified applicants.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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# OPTICALMAN *

## NATURE OF THE JOB

Marine navigation, aviation, and weapons systems in today's Navy depend on the use of scientifically accurate instruments as visual aids. These instruments are called optical instruments. They are kept in good working condition by specialists called Opticalmen.

Opticalmen maintain and repair magnetic compasses, octants, and sextants. (Octants and sextants are instruments used on ships to measure angles of altitude, from the horizon as a reference point, for the purpose of determining longitude and latitude.) Opticalmen work on telescopes and binoculars, on range finders and sights for guns, on submarine periscopes (which make it possible to scan above the water from a submerged submarine), and on other instruments that extend the capabilities of human vision.

Opticalmen manufacture parts—lens cells, for example, and the rings that hold lenses in place, prism mounts, and eyepiece focusing keys. They replace parts; they refinish surfaces on instruments by stripping off old finishes, sanding, and painting; they seal instruments to keep out dirt, moisture, and chemical fumes. They make repairs such as recementing the elements of lenses; and they test for accurate sighting and adjust lines of sight as necessary.

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* Each Opticalman is involved in the general work of the Navy as well as in the work of his own "rating" or occupation. It is very important for each sailor to understand the general work of the Navy as well as the work of his own rating. The first chapter of this manual describes the general work of the Navy.

Maintenance and repair of optical instruments require careful work on small parts. Opticalmen work with fine hand tools and precise measuring instruments. They also do machine tooling to manufacture parts, using equipment like grinders, drill presses, lathes, (to smooth surfaces of materials), and milling machines to do cutting work on metals (to make screw threads, for example, and to bore holes). Opticalmen often refer to mechanical drawings of instruments and parts to help them locate and install parts, reassemble instruments, etc. They make their own working drawings in addition to reading drawings and diagrams provided by manufacturers or by the Navy in repair manuals.

Administrative duties include ordering parts, tools and other working materials. Tools and equipment are inventoried periodically and records maintained. In addition, each shop has a set of technical manuals which describe the theory, testing, operation and repair of optical equipment. Opticalmen keep the manuals up to date by adding or changing information, and they recommend changes to procedures in the manuals based on their experience in operating, testing and repairing the equipment.

## WORKING CONDITIONS

Opticalmen are usually assigned to repair ships or to naval repair facilities ashore. They may be assigned overseas or in the United States. Their work usually takes place in a shop setting.

### Sea-Shore Rotation

Opticalmen spend approximately 10-12 years on "sea duty" during a 20-year period in the Navy. "Sea duty" includes all of the time during which a sailor is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home.

The remaining 8-10 years of a 20-year period in the Navy will be spent on "shore duty," duty at permanent shore locations where the Opticalman will provide support for fleet units.

## QUALIFICATIONS

Opticalmen must be able to do close, exact hand work. They must be patient and willing to take pains for good craftsmanship. They need above average general learning ability and a high degree of mechanical aptitude.

School courses in physics, shop mathematics, and machine shop are good preparation for this job. Experience in optical or camera manufacturing or repair is also very helpful. However, training and experience before joining the Navy are not essential.

## TRAINING PROVIDED BY THE NAVY

Training is offered in service schools, or candidates may study on their own while receiving training from experienced personnel on the job. The basic training topics are machine shop, fundamentals of optics (the science of vision), optical repair and maintenance, telescopes, and navigation instruments.

The following are specific examples of skills and information Opticalmen learn in the Navy:

- Theory of polarized light, double refraction and interference.
- Optical terms and abbreviations; optical and electrical symbols; interpretation of blueprints and mechanical drawings; how to draw working diagrams.
- Methods of determining focusing distances, refracting power, and magnifying power using the metric and the English system of measurement; lens defects and their results.
- Functions and features of eyepiece systems.
- Techniques of optical alignment, including establishment of alignment reference points, use of alignment telescopes, automatic alignment devices, and flat mirrors.
- Construction and assembly of optical instruments.
- Methods of analyzing failures in optical instruments.
- Repair procedures, including: replacement of parts, modules and components; methods of recementing lenses, of drying internal works of instruments using a gas process; methods of sealing to keep out moisture, dust, etc.
- Types of paint removal agents for stripping finish from different metals; types of lens cement; characteristics of paints and thinners commonly used in optical shops.
- How to prepare surfaces and paint optical instruments using spray equipment.

- Machine shop techniques, including: how to do basic machine-tooling jobs using lathe, milling machine, bench grinder and drill press; use of cutting lubricants on various metals; methods of tempering steel (heat-treating steel to increase strength and heat resistance); mathematical calculations requured to determine taper per foot, cutting speeds, clearances, etc.

Opticalmen also receive training in safety precautions needed in their work. For example, they learn the safety precautions for removing paint from electrical equipment or when applying paint and cleaning agents; they learn how to handle and store gas cylinders, radioactive tubes, cathode ray and fluorescent tubes; they learn to use rubber mats and grounding straps when working with electrical power tools and electronic equipment. First-aid training covers treatment for electrical and chemical burns, methods of reviving a person who is unconscious from an electrical shock.

## EMPLOYMENT OPPORTUNITY

There are approximately 320 personnel performing work in the Opticalman rating, of whom about 250 are rated petty officers. Opportunities are good for highly qualified applicants.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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# PATTERNMAKER *

## NATURE OF THE JOB

Patternmakers have an essential role in the manufacture of metal parts used in ship maintenance and in other kinds of maintenance and repair work done in the Navy. Parts are shaped, or "cast," in foundries, by melting metals and pouring them into molds to harden. Patternmakers construct the patterns from which these molds are created. Patternmakers use drafting, carpentry, and metalworking skills, and shop mathematics.

Patternmaking involves several steps. The process may begin with a drawing or blueprint of the part to be produced; or the Patternmaker may use an existing part as a model for pattern layout. A pattern layout is a drawing (or, for complex molds, a set of drawings) of the part, to scale. Templates (preliminary pattern pieces, in actual size, usually in the form of thin metal plates or boards or light frames) may be made from the layout to guide cutting of the actual mold pattern. Patternmakers also construct jigs, which are devices that fasten onto or enclose the piece of work. Jigs have hard steel surfaces and are used to ensure that cut and drill holes, for examples, are made only in the desired places.

Mold patterns usually are made out of wood, metal, or plaster of Paris. They also may be made out of plastic. No matter what material is used, the work must be done precisely, or the mold constructed from the pattern will yield parts that cannot be used.

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* Each Patternmaker is involved in the general work of the Navy as well as in the work of his own "rating" or occupation. It is very important for each sailor to understand the general work of the Navy as well as the work of his own rating. The first chapter of this manual describes the general work of the Navy.

Patternmakers select materials for templates and patterns. They compute the weight, area and volume of the finished pattern and estimate the amount of material that will be needed. Factors such as wood shrinkage, warping and drawing, and metal shrinkage, must be considered when these estimates are made. Patternmakers construct templates and jigs as required, and then cut and finish the pattern pieces. Cutting and finishing procedures depend on the type of material. They may involve, for example, sawing and planing, welding, soldering, sanding, shellacking, etc.

Molds are constructed by foundry personnel called Molders, who also make the rough castings of parts. However, Patternmakers must know about mold construction and casting. For example, they must know methods of building vents into molds to allow gases to escape; they must know how to construct gates, or channels through which molten metal flows into a mold; they must know the proper way to set cores (solid pieces inserted in molds to make non-solid parts, such as hollow cylinders). All of these mold features are planned for when the pattern is made.

In addition, Patternmakers gain knowledge of machine-tooling processe[illegible]hat will be used to turn the rough casting into a finished part. The patter[illegible]ust allow for reduction of part size when its surfaces are machined.

## WOR[illegible] CONDITIONS

These personnel work at naval shipyards or other major repair bases ashore. They are also assigned to sea duty, on repair ships. Their work is done in a shop-type setting.

### Sea-Shore Rotation

Patternmakers spend approximately 12-14 years on "sea duty" during a 20-year period in the Navy. "Sea duty" includes all of the time during which a sailor is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home.

The remaining 6-8 years of a 20-year period in the Navy will be spent on "shore duty," duty at permanent shore locations where the Patternmaker will provide support for fleet units.

## QUALIFICATIONS

Patternmakers need mechanical aptitude. They should enjoy and be good at precision work. There are no special requirements for previous training or experience. School courses in wood shop, foundry, mechanical drawing, and mathematics, including shop mathematics, are helpful preparation for the job, although not essential to qualify. Carpentry experience and model-building are also helpful, but not essential.

## TRAINING PROVIDED BY THE NAVY

Training is provided in service schools or on the job, under supervision of experienced personnel. On-the-job training is supplemented by individual study of Navy training manuals. Patternmakers learn:

- Fundamentals of mechanical drawing, blueprint reading and layout; color codes and symbols used in patternmaking.
- Shop mathematics, including how to compute volumes, weights, and areas; how to compute scaled reductions and increases; and fractions and decimal numbers.
- Uses of tools and instruments in patternmaking, including power tools, hand tools, and instruments such as planers, sanders, drill presses, saws, chisels, gages, shrink rules, and instruments for measuring angles, diameter, and thickness, etc.
- Characteristics and uses of different woods in patternmaking, including how to identify woods by grain and color and lumber structure and cuts; how to select seasoned lumber for different purposes; and the allowances needed in pattern construction for shrinkage, swelling, and warping.
- Characteristics and uses of metals in patternmaking; shrinkage of metals and methods of determining shrinkage.
- Characteristics and uses of other pattern materials including plaster of Paris and plastics.
- Use of pattern finishing materials such as glue, shellac, sandpaper and wood fillers.
- How to make pattern layouts from mechanical drawings, freehand sketches, and castings.
- How to make templates and jigs.
- How to design and construct core boxes; how to assemble patterns for composite castings (castings from molds that have more than one part).
- Relationships between pattern shops, foundries, and machine shops; foundry practices and procedures; terms used in molding and casting.

Patternmakers also receive training in safety precautions for using hand tools, woodworking machinery, and electric and pneumatic power tools.

The skills and knowledge items given here are not a complete list. Its purpose is just to suggest the kinds of things Patternmakers learn in the Navy.

## EMPLOYMENT OPPORTUNITY

There are approximately 180 personnel performing in the Patternmaker rating, of whom about 40 are rated petty officers. Entry opportunities are limited except for highly qualified applicants.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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# PERSONNELMAN [*]

## NATURE OF THE JOB

Personnelmen provide enlisted personnel with information and counseling related to Navy occuptations, opportunities for general education and job training, requirements for promotion, and rights and benefits. They also assist enlisted personnel and their families with special problems. Sometimes, for example, Personnelmen help enlistees get legal aid or help them get reassigned to stations closer to family members because of hardship situations.

In addition, Personnelmen have administrative and clerical duties. They keep records up-to-date, prepare reports, type letters and maintain files. In general, the work of Navy Personnelmen is similar to the work of personnel officers and guidance counselors in civilian jobs, although the work of civilians in the personnel field may require more formal education. Specific examples of these and other duties of Personnelmen follow.

Personnelmen conduct interviews and give tests to identify individuals' interests, aptitudes, educational and work backgrounds, and achievement levels. They analyze interview and test results as a basis for recommending job training, education programs, and work assignments for enlisted personnel. Personnelmen also provide information about reenlistment, retirement, and the benefits that go with each, and they explain Veteran's

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[*] Each Personnelman is involved in the general work of the Navy as well as in the work of his or her own "rating" or occupation. It is very important for each sailor to understand the general work of the Navy as well as the work of his or her own rating. The first chapter of this manual describes the general work of the Navy.

Administration programs and benefits. They help personnel apply for benefits and understand the regulations that govern benefit programs.

Job analysis is another responsibility of Personnelmen. They identify the tasks involved in Navy jobs, or "ratings." Then they evaluate the physical abilities, mental abilities, training, and experience a person needs to do each task. From this kind of analysis, Personnelmen clarify the path of advancement in each rating. Navy enlistees can be told exactly what skills and knowledge they must show, and what training they must complete, to get into a rating and to earn promotions.

Personnelmen also collect and analyze data for Navy planning and management. For example, they prepare reports on the current use of manpower compared with needs for manpower (how many personnel are needed, the locations where they are needed, and the jobs for which they are needed). They prepare reports on the organizational structure of Navy ujits. These kinds of reports are used by Navy managers to improve the efficiency of operations.

Typing, file maintenance and other clerical duties are assigned to Personnelmen. They keep enlisted personnel records up to date; they prepare correspondence related to personnel administration; they complete forms and take care of other requirements for transfer and receipt of personnel in a command; they prepare identification cards, meal passes, leave papers and temporary orders.

## WORKING CONDITIONS

Personnelmen work in office settings and are assigned to all types of ships and shore facilities.

### Sea-Shore Rotation

Personnelmen spend approximately 8-10 years on "sea duty" during a 20-year period in the Navy. "Sea duty" includes all of the time during which a sailor is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home.

The remaining 10-12 years of a 20-year period in the Navy will be spent on "shore duty," duty at permanent shore locations where the Personnelman will provide support for fleet units.

Since Navy women do not serve aboard combatant ships, women in this rating generally work at shore facilities in the United States and overseas.

## QUALIFICATIONS

Personnelmen must have the ability to establish rapport and communicate effectively with other people. They must have above average general learning ability and a high aptitude for clerical work.

School courses in typewriting, public speaking and office practice are helpful, as is experience in personnel work, guidance and counseling, teaching, and recreation supervision. However, no training or experience prior to joining the Navy is required to qualify for the job of Personnelman.

## TRAINING PROVIDED BY THE NAVY

Candidates for the job of Personnelman get their training through on-the-job instruction, along with individual study of Navy training courses. In addition, candidates must successfully complete Basic Personnelman School.

Personnelmen learn the following job skills and background information:

- Good inverviewing procedures, including techniques for establishing rapport, standards of tact and courtesy in providing services to people, importance of maintaining a positive attitude when dealing with people
- Rights, benefits, and services available to active and retired Navy personnel and their dependents including: educational services in general, programs leading to higher education and/or commissioned rank, regulations concerning eligibility for service schools, sources of educational materials; qualifications for advancement in a Navy rating, job performance evaluation procedures, policy on promotions and change of job category; leave policy: policy on unauthorized absence, desertion and lost time; policy on enlistment, reenlistment, transfer discharge and release from active duty; travel regulations; medical benefits; survivors' benefits; Veteran's Administration regulations and programs
- How to administer, supervise, score, record, and file tests used in the Navy; how to interpret scores and convert raw scores to standard scores; how to evaluate test results in relation to information obtained in personal interviews

- Techniques of educational, occupational and other kinds of counseling
- Procedures for ordering, maintaining and issuing educational and training manuals and materials; accounting procedures for personnel materials
- How to perform job analyses, identify job requirements and rate job skills
- Methods used in organizational analysis and assessment of needs for manpower including: how to prepare charts showing division of authority and flow of work; how to evaluate work flow and procedures for the purpose of finding ways to simplify them; procedures measuring work efficiency and productivity; how to conduct staffing surveys
- Basic office practices including typing, use of duplicating equipment and calculating machines; routine maintenance of office machines; file organization and maintenance; procedures for setting up new personnel records and for adding information to records; telephone procedures; preparation of correspondence according to Navy standards; and proper English grammar and punctuation.

The list does not cover everything Personnelmen learn, but it gives an idea of the kinds of skills and knowledge they gain in the Navy.

## EMPLOYMENT OPPORTUNITY

There are approximately 7,700 men and women performing work in the Personnelman rating, of whom about 5,700 are rated petty officers. Opportunities exist for highly qualified personnel.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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# POSTAL CLERK*

## NATURE OF THE JOB

The Navy operates a large postal system to collect and distribute mail at naval facilities. This system is manned by enlisted personnel in the Postal Clerk rating. Their work is very much like that of civilian personnel who work for the U.S. Postal Service.

Navy Postal Clerks directly serve customers by selling stamps and money orders, weighing mail and determining the cost of mailing, and computing and collecting fees for registered and insured items. The clerks collect on postage-due mail and make refunds for overpayment. They prepare customs declarations stating the content and value of packages that will be sent to foreign nations. They answer questions and complaints about services and delivery schedules, carry out procedures necessary to trace mail that has gone astray, and process claims for losses.

When the mail arrives at naval facilities, Postal Clerks sort it and load it on postal vehicles for delivery. They collect outgoing mail, cancel the stamps, and send the mail on its way.

A variety of record-keeping and reporting duties are necessary for efficient postal services. Postal Clerks provide a directory service to aid in delivering mail that is not addressed completely or properly. They maintain a locater file on ships and mobile units served by each Navy post office.

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* Each Postal Clerk is involved in the general work of the Navy as well as in the work of his or her own "rating" or occupation. It is very important for each sailor to understand the general work of the Navy as well as the work of his or her own rating. The first chapter of this manual describes the general work of the Navy.

Records are kept on inquiries, complaints, and claims and the responses to them. Other records are kept for the purpose of preparing reports to Postmasters and to the Chief of Naval Operations -- the personnel who have top management responsibility for the postal service. Postal Clerks regularly compile statistics on the volume and flow of mail, the amounts of money received at post offices, and other data needed to insure good service and make plans.

Postal Clerks keep inventories of the supplies, such as stamps, blank money orders and forms for various purposes, and requisition supplies as needed. The clerks also have responsibility for the condition of equipment they use. For example, they lubricate and adjust postal scales, hand trucks, adding machines, cancellation machines, typewriters, forklifts used to move heavy items and large bundles of mail, and baling equipment used to tie bundles of mail.

## WORKING CONDITIONS

Postal Clerks work in Navy post offices on ships and at shore stations. They may be assigned overseas or in the United States.

### Sea-Shore Rotation

Postal Clerks spend approximately 12-14 years on "sea duty" during a 20-year period in the Navy. "Sea duty" includes all of the time during which a sailor is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home.

The remaining 6-8 years of a 20-year period in the Navy will be spent on "shore duty", duty at permanent shore locations where the Postal Clerk will provide support for fleet units.

Since Navy Women do not serve aboard combatant ships, women in this rating generally work at shore facilities in the United States and overseas.

## QUALIFICATIONS

Postal Clerks must have the ability to deal successfully with people. They must display patience, courtesy, and interest in providing good service.

Experience in the civilian postal service is helpful. School courses in English, arithmetic typing, and geography are good preparation. However, previous training and experience is not required for the Postal Clerk rating.

## TRAINING PROVIDED BY THE NAVY

Candidates may train on the job or in service schools. Training covers:

- Postal regulations, classes of mail, rates of postage and procedures for distributing and dispatching mail.
- Procedures for handling registered, certified, and insured mail; customs requirements; procedures for receiving, issuing, and accounting for money orders.
- How to load and unload mail to prevent damage and loss.
- How to prepare forms required for transportation of military mail.
- Methods of planning mail transportation schedules and routes.
- Procedures for storing and disposing of loose articles and undeliverable mail.
- Accounting procedures used in the postal service; how to report errors.
- How to estimate needs for postal supplies and equipment and prepare requisition forms.
- Maintenance and repair of postal machines and equipment.
- What to do with mail, postal funds, and postal equipment aboard ship when entering a combat area, when there is immediate danger of being captured, or when abandoning ship.
- Security regulations and procedures to protect classified material (material containing information that cannot be given out generally because it is important to national defense); how to change a safe combination when there is a possibility the combination may have become known by people who have no need to know it; regulations for assigning security classifications; procedures for receiving and dispatching classified material.

This list of skills and knowledge is not complete, but it shows the kinds of things Postal Clerks learn in the Navy.

## EMPLOYMENT OPPORTUNITY

There are approximately 1,000 men and women performing work in the Postal Clerk rating, of whom about 850 are rated petty officers. Opportunities are excellent for qualified applicants.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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# PHOTOGRAPHER'S MATE*

## NATURE OF THE JOB

Photographer's Mates are the Navy's professional photographers. They operate several different kinds of cameras in a variety of assignments. For example, Photographer's Mates cover news events and make photographs for various Navy publications, including official historical documents and public relations materials. They do portrait photography; they use cameras for photographic copying; they operate aerial cameras for mapmaking and reconnaissance purposes; and they make motion pictures for training and other uses. In addition to camera operation, Photographer's Mates are responsible for camera maintenance and repair and for film processing.

Specific activities related to camera operation include selecting the correct combination of camera settings for different subjects and effects; determining the best subject or camera position or both to get good photo composition (a pleasing, interesting arrangement of shapes in a picture); selecting filters for both black and white and color photography; and loading film. Photographer's Mates also arrange for proper lighting and set up artificial lighting as needed. They also learn special procedures for handling and operating cameras in hot and cold weather extremes.

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* Each Photographer's Mate is involved in the general work of the Navy as well as in the work of his or her own "rating" or occupation. It is very important for each sailor to understand the general work of the Navy as well as the work of his or her own rating. The first chapter of this manual describes the general work of the Navy.

Different kinds of photography call for different techniques. Aerial photography is a major specialty area that involves unique techniques and equipment (night aerial photography equipment, for example) and equipment to compensate for image motion during the day or night.

In photographic processing laboratories, Photographer's Mates weigh and mix photographic solutions; develop black and white and color film; develop and wash black and white prints; select filters to adjust colors; and make color prints. They attach identification labels to negatives and prints and file them or put captions on photographs to be used for public information. They assemble prints from aerial film into mosaics (composites made by putting together pieces of different prints). They edit, splice, and title motion picture film.

The equipment maintenance duties of Photographer's Mates require them to use chemical solvents for cleaning parts, to apply lubricating materials, to replace worn or damaged parts in cameras and film processing equipment, to check the timing of camera shutter closing, and to do other maintenance tasks on a regular basis.

Administrative duties include ordering parts, tools and other working materials. Tools and equipment are inventoried periodically and records maintained. In addition, each shop has a set of technical manuals which describe the theory, testing, operation and repair of cameras and camera equipment. Photographer's Mates keep the manuals up to date by adding or changing information, and they recommend changes to procedures in the manuals based on their experience in operating, testing and repairing the equipment.

## WORKING CONDITIONS

Photographer's Mates are assigned to aircraft carriers and other large ships, and to naval bases and naval air stations. They receive assignments abroad as well as in the United States.

Aerial photography specialists are assigned to aircraft carriers or naval air stations. They must qualify for flight as crew members.

### Sea-Shore Rotation

Photographer's Mates spend approximately 8-10 years on "sea duty" during a 20-year period in the Navy. "Sea duty" includes all of the time during which a sailor is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home.

- The remaining 10-12 years of a 20-year period in the Navy will be spent on "shore duty", duty at permanent shore locations where the Photographer's Mate will provide support for fleet units.

Since Navy women do not serve aboard combatant ships, women in this rating generally work at shore facilities in the United States and overseas.

## QUALIFICATIONS

Candidates for the job of Photographer's Mate need normal color vision, good general learning ability, and the ability to use mathematics for practical problem-solving. People interested in becoming aerial photographers must be able to pass the physical examination for flight duty.

No training or experience before joining the Navy is required to qualify for this job. However, school courses in physics and chemistry are desirable, and experience in photography as a hobby or on the job is very valuable preparation.

## TRAINING PROVIDED BY THE NAVY

Candidates may qualify by combining on-the-job training with individual study of Navy training manuals, or they may attend a service school for training. Basic training covers the following topics:

- Fundamentals of photography, including optics and lenses, types and characteristics of film, theory of film exposure and how to calculate proper exposure, use of filters, use of artificial lighting, and use of flash equipment.
- Operation of reflex, view, press, and copying cameras, hand-held aerial cameras, vertical reconnaissance cameras, and hand-held 35-mm and 16-mm motion picture cameras.
- Laboratory procedures, including nature and uses of chemicals and solutions and photographic emulsions; film developing; contact printing and projection printing; operation of automatic film developing machines; operation of film dryers; theory and practice in processing aerial film and prints; and theory and practice in processing motion picture film.

Other examples of skills and knowledge that Photographer's Mates learn in the Navy include:

- Uses of photography in the Navy; major types of events photographed for public information purposes; types of aerial photography and aerial reconnaissance missions.
- Aerial mapping and production of aerial mosaics.
- How to recognize film negative defects caused by improper exposure and film development; techniques for correcting defects in negatives and in prints.

- Techniques of stripping film (putting together pieces from different negatives); techniques of editing and splicing motion picture film; techniques of assembling a series of still-camera prints to depict an extended event.

Photographer's Mates also get rather extensive training in safety precautions for handling poisonous and flammable materials, and materials that can burn or eat away skin ("corrosive" materials). They learn first-aid techniques, too, including methods of neutralizing acids and alkalis that may get on the skin, antidotes for photographic materials that are poisonous, and proper ways of treating victims of poisoning.

## EMPLOYMENT OPPORTUNITY

There are approximately 2,550 men and women performing work in the Photographer's Mate rating, of whom about 1,930 are rated petty officers. Entry opportunities are limited except for very highly qualified applicants.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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## PHOTOGRAPHIC INTELLIGENCEMAN*

### NATURE OF THE JOB

Military information, particularly secret information about enemies or potential enemies, is called "intelligence". Navy personnel in a number of different jobs participate in collecting and interpreting intelligence data. Among these personnel are Photographic Intelligencemen. They analyze photographs taken from airplanes, ships, and radar installations, to extract information that may be useful in military planning. From the photographic data, Intelligencemen prepare charts, maps, reports, and other materials that describe in detail the features of strategic areas all over the world.

Intelligencemen screen incoming photographs to see if they reveal objects, installations, or conditions of any kind that may have intelligence value. Photographic analysis may be used to identify planes and ships or to assess the extent of bomb damage. Analysis of special kinds of photographs may uncover camouflage.

The Intelligencemen study photographs in relation to topographic maps (maps of the contours and surface features such as rivers, roads, etc., of an area of land), hydrographic maps (maps showing the characteristics of a body of water, such as the contours of the water bottom, depths, positions of channels and shoals, etc.), and aeronautical charts (charts used in guiding aircraft flights). They use existing maps and charts to help them analyze photographs -- for example, to help them determine the direction of aerial photographs, estimate the area covered by aerial photographs, calculate scale, and determine the size of objects shown in photographs. On the other hand, the photographs may reveal errors in existing maps and charts. In such cases, Photographic Intelligencemen make corrections to improve the accuracy of the maps or charts.

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Information from photographic analysis may go immediately into "hot" reports, when there is an urgent need for action. Routinely, Photographic Intelligencemen prepare summaries of the information gained by each mission involving photography. The Intelligencemen also compile information and prepare special materials for mission planning. They prepare flight plots to guide pilots to target areas in photographic reconnaissance missions or in bombing missions during a war. They prepare other materials needed to brief personnel who will participate in air and sea missions, and they operate audiovisual equipment in briefings.

## WORKING CONDITIONS

Photographic Intelligencemen may be assigned to fleet staff offices, to large ships, to aircraft squadrons, or to naval air stations. They may be assigned to stations in the United States or abroad.

### Sea-Shore Rotation

Photographic Intelligencemen spend approximately 10-12 years on "sea duty" during a 20-year period in the Navy. "Sea duty" includes all of the time during which a sailor is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home.

The remaining 8-10 years of a 20-year period in the Navy will be spent on "shore duty", duty at permanent shore locations where the Photographic Intelligenceman will provide support for fleet units.

Since Navy Women do not serve aboard combatant ships, women in this rating generally work at shore facilities in the United States and overseas..

## QUALIFICATIONS

Candidates must have above-average general learning ability and good ability to use practical mathematics. Normal vision, including normal ability to distinguish colors, is required. School courses in mathematics and mechanical drawing are desirable preparation for those interest in becoming Navy Photographic Intelligencemen. However, no training or experience before joining the Navy is required to qualify for the job.

## TRAINING PROVIDED BY THE NAVY

Photographic Intelligencemen may go to a service school for training, or they may get their training through on-the-job instruction combined with individual study of Navy courses. Training covers basic photography and photographic laboratory techniques; principles of air and water navigation; map reading and mapmaking; chart reading and charting, including preparation of charts to aid navigation; drafting methods using standard instruments and equipment; office procedures; and clerical skills.

The following list gives specific examples of skills and knowledge acquired by Photographic Intelligencemen in the Navy. The list is not complete; its purpose is just to give an idea of the kinds of things Intelligencemen learn.

- Basic skills in working with maps, charts, and making photographic measurements; how to measure distances on maps and charts; how to measure areas and objects in photographs; types of map projections and grid systems; reliability of different kinds of maps; topographic and military symbols used on maps and charts; uses of a slide rule in making photographic computations; methods of creating a photographic mosaic (a composite photograph made up of pieces of several photographs).
- Interpretation and processing of photographs to obtain intelligence data; purposes, types, and subjects of photographic intelligence reports; how to plot photographs taken from aircraft; how to interpret radarscope photographs; use of standard equipment for putting titles on aerial photographs; methods of using photographs to assess bomb damage, to identify the functions of industries and installations, to determine the vulnerability of industries and installations; methods of detecting camouflage; interpretation of color, infrared and panoramic photographs.
- Mission planning: methods of making transparencies and overlays for use as visual aids in mission planning; operation of audiovisual equipment for presentations in briefings; types and uses of aerial photography coverage; capabilities of cameras used for photographic reconnaissance; preparation of flight plots for air reconnaissance missions; types of radar simulation devices and their uses; radar target materials used in planning attack missions; factors used in selecting aim and initial points for attack missions.

- Administration: procedures for issuing, receiving, and maintaining files of maps, charts, and intelligence publications; procedures for requisitioning intelligence materials and equipment; use of the Navy Intelligence Subject Code for categorizing intelligence data; procedures for disposing of out-of-date intelligence records and materials, etc.

## EMPLOYMENT OPPORTUNITY

There are approximately 550 men and women performing work in the Photographic Intelligenceman rating, of whom about 400 are rated petty officers. Entry opportunities are limited except for highly qualified applicants.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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# QUARTERMASTER *

## NATURE OF THE JOB

The Quartermaster's job is to help keep the ship on a safe, accurate course at sea. This involves four major kinds of duties:

- Steering
- Navigation
- Standing watch
- Signaling.

Quartermasters serve as steersman (ship pilots). They also assist ship officers responsible for navigation—the planning, correcting and maintaining the ship's course or route on the water. In their navigational duties, Quartermasters use special instruments—for example, compasses, fathometers to test the depth of the water, and radar equipment to check the ship's bearing (position in relation to other objects or locations). Quartermasters also use a variety of navigational publications including oceanographic or hydrographic charts (charts of water characteristics such as current, channels, depth, tides, etc.). The Quartermasters are responsible for adjusting and caring for the navigational instruments and equipment they use, and they order and keep up-to-date the navigational publications so important to their work. The Quartermasters are also responsible for keeping the ship's log—the record book of the

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* Each Quartermaster is involved in the general work of the Navy as well as in the work of his or her own "rating" or occupation. It is very important for each sailor to understand the general work of the Navy as well as the work of his or her own rating. The first chapter of this manual describes the general work of the Navy.

ship's daily progress (including speed, maneuvers, course corrections, etc.) and of events such as visits by Navy and civilian officials.

"Standing watch" is an important part of Quartermasters' work and includes looking out for conditions that could interfere with the safe progress of the ship, such as other ships and boats, natural obstacles in the water, changing weather and changing water conditions. The watchman keeps a vigilant lookout from the "bridge" (the raised structure from which a ship is steered). Quartermasters take their turn standing watch and train and supervise other sailors who are assigned this duty.

Quartermasters also serve as signalmen. They send both visual and sound messages to other ships or to shore, and they receive and decode incoming messages. To do this Quartermasters must know how to use and understand flashing light signals, semaphore (hand flag) signals, and International Morse code.

Quartermasters may pilot tugboats, patrol boats and other harbor craft which operate close to shore. Quartermasters often are assigned as petty officers in charge of harbor craft.

## WORKING CONDITIONS

Quartermasters are assigned to all types and sizes of ships. Most of their work is done on the "bridge", in the pilot house or in the chart house. Assignments ashore may include hydrographic offices, where navigational publications are prepared, or offices from which the movement of ships into and out of ports are controlled.

### Sea-Shore Rotation

Quartermasters spend approximately 12-14 years on "sea duty" during a 20-year period in the Navy. "Sea duty" includes all of the time during which a sailor is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home.

The remaining 6-8 years of a 20-year period in the Navy will be spent on "shore duty," duty at permanent shore locations where the Quartermaster will provide support for fleet units.

Since Navy women do not serve aboard combatant ships, women in this rating generally work at shore facilities in the United States and overseas.

## QUALIFICATIONS

Quartermasters must have above-average ability to think and to learn; to work with charts, maps and instruments; to concentrate, maintain vigilance, and be conscientious in keeping complete, accurate records. Quartermasters must be able to express themselves clearly in speaking and writing. Good vision and hearing are also required.

There are no special educational requirements to qualify for Quartermaster. It is helpful, however, to have previous schooling in physics, geometry, public speaking and grammar.

## TRAINING PROVIDED BY THE NAVY

Candidates for Quartermaster receive training in school, on the job, and through individual study of manuals and other publications relevant to the job. Training covers:

- International Morse code.
- Buoyage system for United States and foreign waters (buoys are floating markers used, for example, to point out channels or water traffic lanes, or to point out the position of something beneath the water such as a rock, sandbar or sunken wreck.) "Buoyage system" refers to the meaning of different sizes, shapes, colors and other features of buoys that are used in different waters.
- Regulations for the use of lights, signals, and other "Rules of the Road" (the traffic rules established to make sure that boats and ships move safely).
- Systems of time zones and the computation of time.
- Meteorology.
- Instruments such as barometers, fathometers, chronometers, etc.
- Plotting instruments such as dividers and compasses, parallel rulers, and protractors.
- Compasses
- Charts, sailing directions, tables commonly used by navigators.
- Radio aids to navigation.
- Celestial navigation (navigation based on a ship's position in relation to the positions of the sun and other stars).
- Systems of communication within the ship.

## EMPLOYMENT OPPORTUNITY

There are approximately 4,400 men and women performing work in the Quartermaster rating, of whom about 3,100 are rated petty officers. Opportunities are limited except for highly qualified applicants.

## ADDITIONAL INFORMATION

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## RADIOMAN *

### NATURE OF THE JOB

Navy activities often involve people working at many different locations, on land and at sea. Sometimes hundreds of separate units participate in a mission. Radiomen operate the radio communications system that makes such complex teamwork possible. They transmit and receive messages for fast, accurate communications.

Radiomen operate several kinds of transmitting equipment including radiotelephone, radiotelegraph and radioteletype machines. Sometimes they send and receive voice messages, but usually messages are in International Morse Code. Radiomen prepare messages for international and domestic commercial telegraph in addition to sending and receiving messages via the Navy system. They keep logs in which they record every message sent or received.

Radiomen are responsible for keeping the equipment they use in good operating condition. They install equipment and service, adjust and make simple electrical and electronic repairs as well as mechanical repairs. (Complex maintenance and repair jobs must be done by specially trained technicians.)

The following are specific examples of some of the work Radiomen do in transmitting and receiving messages. Among other things Radiomen:

- Tune transmitters to improve the clarity of signals.

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* Each Radioman is involved in the general work of the Navy as well as in the work of his or her own "rating" or occupation. It is very important for each sailor to understand the general work of the Navy as well as the work of his or her own rating. The first chapter of this manual describes the general work of the Navy.

- Make sure the clocks they are using are in accordance with the time as transmitted by the National Bureau of Standards radio station.
- Select the best frequency for transmitting messages for varying distances under the existing atmospheric conditions.
- Authenticate incoming messages (that is, they verify the sources and the accuracy of messages).
- Detect and report electronic jamming on radio receiving equipment and use special procedures for receiving through interference.
- Trace messages to identify their sources or to find out where transmission failed.
- Receive and locate the sources of emergency messages (from ships or aircraft that have gone astray, for example) and they transmit emergency messages.
- Use cryptographic equipment to decipher messages sent in secret code.
- Stand "communications watch," which means they take turns monitoring the equipment at all times, to make sure no incoming signal is missed.

Radiomen also must be able to set up communications systems. This means that they learn to select the proper combinations of antennas, transmitters, receivers and associated terminal equipment, and crytographic equipment. In addition to selecting the proper combination of equipment, Radiomen make the circuit connections necessary for the various units to work together.

In the area of maintenance and repair, Radiomen have a variety of duties. They do routine tasks like lubricating typewriters, changing typewriter ribbons, and changing ribbons, tapes and paper in teletypes. They repair radio headsets and microphones and they replace indicator lamps, electron tubes, fuses and switches in transmitting and receiving units. They also use special test equipment to locate electrical and electronic failures and/or to check signal quality against standards.

## WORKING CONDITIONS

Radiomen work on all types of ships and at shore-based communication stations. They may work at shore stations overseas as well as in the United States.

### Sea-Shore Rotation

Radiomen spend approximately 10-12 years on "sea duty" during a 20-year period in the Navy. "Sea duty" includes all of the time during which a sailor is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spend in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home.

The remaining 8-10 years of a 20-year period in the Navy will be spent on "shore duty," duty at permanent shore locations where the Radioman will provide support for fleet units.

Since Navy women do not serve aboard combatant ships, women in this rating generally work at shore facilities in the United States and overseas.

## QUALIFICATIONS

Radiomen must have good general learning ability, good hearing and good manual dexterity. They must show an aptitude for learning radio code and they must be eligible for a clearance to handle top secret information.

Courses in math, physics and electricity would be good preparation for this job. Experience as a ham radio operator is helpful, and it is helpful to know how to type. However, no training or experience before joining the Navy is required.

## TRAINING PROVIDED BY THE NAVY

Candidates get their training by studying Navy training manuals and correspondence courses, by learning on the job under the supervision of experienced personnel, and by attending service schools. The basic training topics are:

- Operation of communications equipment
- Use of International Morse Code in radio communications
- Radioteletype and radiotelephone communications
- Typewriting
- Basic electricity, basic electronics and communications equipment circuitry

- Maintenance procedures
- Procedures and devices for testing communications equipment.

The following list gives more specific examples of the skills and knowledge Radiomen learn in the Navy:

- Types and uses of various kinds of radio receiving, transmitting and terminal equipment, including teletypewriters and radiotelephones
- Types and uses of communications antennas
- Procedures for tuning radio transmitting and receiving equipment
- Procedures for receiving through electronic and other types of interference
- Definitions of common electrical and electronic terms used with radio equipment such as volt, ohm, ampere, watt, hertz, frequency and selectivity
- Relationship between voltage, resistance, current and power
- Basic concepts of radio wave travel through space
- Relationship of antenna length to frequency
- Functions of basic circuits
- Use and maintenance of hand tools, safety equipment and systems
- How to read block diagrams and schematics of communications equipment and systems
- How to restore communications equipment after failures
- Procedures for decoding and for protecting secret information
- Regulations on commercial message traffic that affect naval communications; how to prepare messages for commercial transmission
- Use of identification signals
- How to keep logs on radio communications.

Radiomen also learn first-aid techniques and safety precautions for working with electrical and electronic equipment. They learn to rescue a person in contact with the "live" electrical conductors, to revive a person who is unconscious from electrical shock, and to treat electrical and chemical burns.

## EMPLOYMENT OPPORTUNITY

There are approximately 17,200 men and women performing work in the Radioman rating, of whom about 13,000 are rated petty officers. Opportunities are good for qualified applicants.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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# SHIP'S SERVICEMAN *

## NATURE OF THE JOB

Ship's Servicemen provide services for sailors ashore and afloat by operating and managing such services as barber shops, tailor shops, ships' uniform stores, laundries, dry cleaning plants and cobbler shops. They also serve as clerks in retail stores, soda fountains, gasoline stations, warehouses and commissary stores. Some Ship's Servicemen also function as Navy club managers.

In operating such services, Ship's Servicemen requisition goods and supplies, maintain specialty shop equipment, take inventories and prepare various records and reports.

At the Third Class Petty Officers level, Ship's Serviceman specialize as laundrymen, dry cleaners, barbers, tailors or clerks. At the Second Class Petty Officers level and above, Ship's Serviceman develop and carry out administrative and managerial skills.

## WORKING CONDITIONS

Ship's Servicemen are assigned to all types of larger ships and to shore stations where Navy exchange facilities exist.

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* Each Ship's Serviceman is involved in the general work of the Navy as well as in the work of his or her own "rating" or occupation. It is very important for each Ship's Serviceman to understand the general work of the Navy as well as the work of his or her own rating. The first chapter of this manual describes the general work of the Navy.

## Sea-Shore Rotation

Ship's Servicemen spend approximately 10-12 years on "sea duty" during a 20-year period in the Navy. "Sea duty" includes all of the time during which a sailor is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home.

The remaining 8-10 years of a 20-year period in the Navy will be spent on "shore duty," duty at permanent shore locations where the Ship's Serviceman will provide support for fleet units.

Since Navy women do not serve aboard combatant ships, women in this rating generally work at shore facilities in the United States and overseas.

## QUALIFICATIONS

Ship's Servicemen must display some aptitude for the specialty they wish to follow. Courses or experience in barbering, tailoring, merchandising, salesmanship, accounting, bookkeeping, business arithmetic and business English are helpful but are not required.

## TRAINING PROVIDED BY THE NAVY

Training for the Ship's Serviceman rating is provided by on-the-job instruction, by completion of Navy correspondence courses, and by individual study of Navy training manuals. Ship's Servicemen with advanced ratings may take special courses in retailing and merchandising, managerial procedures and accounting.

Training covers such subjects as:

- Sanitary and safety procedures in the operation, maintenance and stocking of retail outlets
- Accounting procedures and regulations
- Stock estimates and purchase orders
- Preparation of records, reports and correspondence
- Operation, maintenance, repair and test of equipment and in a particular specialty (laundry, tailor shop, boiler shops or store)
- Principles of business and personnel management
- Pollution control including the effect of detergents and other cleaning agents on water and as water pollutant.

## EMPLOYMENT OPPORTUNITY

There are approximately 3,500 men and women performing work in the Ship's Serviceman rating, of whom about 3,000 are rated petty officers. Shortages exist and opportunities are excellent for qualified applicants.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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# SIGNALMAN *

## NATURE OF THE JOB

Signalmen serve as lookouts aboard ships and relay information about possible dangers to ship personnel. Signalmen also use visual signals and voice radio to communicate with other ships.

Signalmen stand watch on the bridge (the raised structure on the deck of a ship). They look out for other ships, for aircraft, for natural obstacles in the water, for waterway markers that help ships stay on course, and for signs of weather change. They make sure that other ship personnel are aware of their sightings. They also alert the crew to render honors to a passing ship. (To "render honors" means to show respect by coming to attention and saluting, and by other kinds of ceremonial recognition.)

Signalmen also serve as assistants to ship navigators. They identify visual aids to navigation such as buoys in the water and lighthouses and distinctive natural or man-made features along shore areas. They take bearings visually and with special instruments. ("Taking a bearing" means determining the direction from the ship to another ship or to a fixed point like a tip of land.)

Directing man-overboard operations is a special responsibility of Signalmen. When someone falls into the water from a ship, the rescue can be a complicated process. A small boat or boats must be lowered from a large

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ship or a helicoptor must be launched to pick up the person in the water. It is easy to lose sight of someone in the water. Signalmen keep watch on the location of whoever is being rescued and direct the rescuers to the right place.

Signalmen's message-sending and signaling instruments include their hands, arms and voices, electrical and electronic lights, infra-red lights, flags, whistles and voice radio. They may use pyrotechnics (fireworks) such as flares, for distress signaling. Signalmen are responsible for making sure the equipment and materials they use are in good order. They do routine upkeep and repair work, and regularly check equipment and supplies. They are responsible for requesting repairs that must be made by other personnel and for reordering supplies.

In today's Navy, Signalmen most often use flashing lights to send messages in International Morse Code, or they use voice radio. But Signalmen still learn to be experts in the old techniques of semaphore (hand flag) and flag hoist signaling. The meaning of hand flag signals depends on the position of hands and arms. Flags are held to make the positions easier to see. Flag hoists are lines with various flags attached. The flags contain various colors arranged in different patterns and represent letters, numbers and symbols. The arrangement of the flags indicates a message or some information. Signalmen raise these flags on a line to communicate with other personnel on their own ship, another ship, or both.

## WORKING CONDITIONS

Signalmen are assigned to all types and sizes of ships. Their usual place of work is the bridge or a special platform called the signal bridge. They work day and night shifts and often work out of doors, regardless of weather conditions. Ashore, they are assigned to naval bases, training centers and repair facilities.

### Sea-Shore Rotation

Signalmen spend approximately 12-14 years on "sea duty" during a 20-year period in the Navy. "Sea duty" includes all of the time during which a sailor is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home.

The remaining 6-8 years of a 20-year period in the Navy will be spent on "shore duty," duty at permanent shore locations where the Signalman will provide support for fleet units.

Since Navy women do not serve aboard combatant ships, women in this rating generally work at shore facilities in the United States and overseas.

## QUALIFICATIONS

Signalmen must have good vision and hearing. They must have good general learning ability and be able to speak and write clearly. School courses in grammar and electricity are helpful, but are not essential to qualify.

## TRAINING PROVIDED BY THE NAVY

Candidates train for this job by studying Navy manuals and other publications. Candidates also must practice until they can pass a performance test on sending and receiving messages by flashing lights and hand signals. Training is also provided in service schools. The basic topics covered in training are as follows:

- International Morse Code
- Flashing light and semaphore (hand flag) signaling
- Flag hoise signaling
- Standard international distress and emergency signals
- Identification of the national ensign, personal flags (ceremonial flags that go with high ranking officers) and pennants
- Honors and ceremonies
- Basic navigation.

The following are specific examples of skills and knowledge Signalmen acquire in the Navy:

- How to locate light switches for electrical and electronic visual signal equipment controlled from the signal bridge and operate them in darkness
- How to send and receive (interpret) flashing light signals in code and in plain language
- How to make, use and identify flag, light and pyrotechnic international distress signals, emergency signals and storm-warning signals
- How to identify and interpret aircraft, surface ship and submarine emergency signals
- How to operate a voice radio
- Procedures used to correct, repeat, receive, verify and cancel messages and flag hoist signals

- Responsibilities of the person who originates a visual message; responsibilities in passing and relaying messages and flag hoist signals
- Requirements for protecting the security of communications (for preventing communications from being intercepted by those who should not know or have no need to know the content of the message)
- How to direct small boats in man-overboard rescues during the day and at night
- The U. S. system of buoyage (system of marking waterways with floating and fixed aids to navigation), including types of buoys and the meaning of their markings, numbers and colors
- "Rules of the Road" for vessels on international and inland waters including the characteristics and meanings of lights carried on vessels; fog signals used while under way and at anchor; differences in rules for power vessels, sailing vessels and seaplanes; right-of-way rules and whistle signals for overtaking, crossing in front of and meeting another ship.

This list does not cover everything Signalmen learn. It's purpose is to give an idea of the kinds of things they learn through a combination of study and work experience in the Navy.

## EMPLOYMENT OPPORTUNITY

There are approximately 3,000 men and women performing work in the Signalman rating, of whom about 2,300 are rated petty officers. Opportunities are good for qualified applicants.

## ADDITIONAL INFORMATION

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## SONAR TECHNICIAN *

### NATURE OF THE JOB

Sonar Technicians have responsibility for underwater surveillance. They aid in safe navigation and in search, rescue and attack operations.

Sonar Technicians use electronic equipment, called sonars, to detect the presence of surface ships operating at a distance, submarines above and below the water, objects under the water such as wrecks and mines, and natural obstructions such as reefs. There are two basic kinds of sonar operation—passive and active. Passive sonar involves only listerning devices. The sonar picks up sounds produced by the propellers or engines of ships and submarines, for example. Active sonar involves sound transmission as well as sound receiving. The sound impulses transmitted by the equipment bounce off submerged objects. The echoes, or deflected sound waves, are picked up by a receiving unit and the wave forms are displayed visually on a screen. Passive sonar generally is used for initial detection for the presence of another ship, object, etc. Active sonar provides more precise data, but at the risk of revealing the ship's presence to enemy sonars because the sound signal that is transmitted can be intercepted. Sonar Technicians maintain, operate and interpret data from sonar equipment. The following are specific examples of the tasks involved in this work.

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Sonar Technicians test and evaluate water conditions to determine the range of sonar effectiveness. (The range of effectiveness is the farthest distance, in all directions, from which the sonar would be likely to detect another vessel, object, etc.) Sonar Technicians start, tune, operate, monitor and stop sonar equipment. They make tape recordings of the sounds picked up and they evaluate the type of "contact" (the type of object that is causing the sound). They determine the direction in which a moving contact is heading. They use plotting equipment to help them pinpoint the location and movement of a target. They report sonar information in writing and, in emergencies, make immediate verbal reports.

Sonars can be used to send and receive ship-to-ship communications in International Morse Code. The ships involved must, of course, be equipped with sonar, and messages sent this way will not go great distances. However, sometimes this kind of communication has advantages—for example, when it is believed messages transmitted by radio might be intercepted. Sonar Technicians send and receive code messages by sonar as required. They also operate underwater telephones for direct voice communications. Sonar Technicians also operate sonar countermeasures equipment, which produces interference to disrupt enemy sonars. In addition, Sonar Technicians have fire control duties. For example, they determine the best time to fire torpedoes, based on the speed and course of the target. They also operate equipment used to control automatically the launching or firing of underwater weapons.

Equipment maintenance is another area of responsibility for Sonar Technicians. They use skills in mechanical, electrical, and electronic maintenance and repair to make sure the devices they use are in good operating condition. This part of the job involves a variety of tasks from routine inspection and lubrication of equipment to the replacement of electronic components. Major repairs, however, are done by electronic repair specialists.

## WORKING CONDITIONS

Sonar Technicians are assigned to any ship fitted with sonar equipment. Usually they are assigned to submarines, destroyers, destroyer-escorts or other ships involved in patrol activities. Ashore, they are assigned to naval bases, training centers and repair activities.

### Sea-Shore Rotation

Sonar Technicians spend approximately 12-14 years on "sea duty" during a 20-year period in the Navy. "Sea Duty" includes all of the time during which a sailor is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at homes bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home.

The remaining 6-8 years of a 20-year period in the Navy will be spent on "shore duty," duty at permanent shore locations where the Sonar Technician will provde support for fleet units.

## QUALIFICATIONS

Sonar Technicians must have acute hearing. They cannot have any hearing defects, and they must be able to pass a test of ability to detect small differences in the pitches of tones. They also must have good vision. Glasses or contact lenses are allowed, but no major vision problems. Other requirements include clear speech, good general learning ability and good basic math skills.

School courses in algebra, geometry, physics, electricity and shop are helpful preparation, but are not essential. Experience as an amateur radio operator is also helpful but not essential.

## TRAINING PROVIDED BY THE NAVY

Candidates for Sonar Technician may get their training on the job, under the guidance of experienced personnel; they may study training manuals and complete correspondence courses on their own; or they may attend service schools for training. The basic training topics include:

- Operation of sonar equipment
- International Morse Code communications
- Fundamentals of electricity and electronics; sonar equipment circuitry
- Procedures for cleaning and lubricating sonar equipment; use of test equipment to check the electronic performance of sonars.

The following list gives more specific examples of what Sonar Technicians learn through study and work experience:

- How to distinguish sounds caused by different types of ships, objects, and natural phenomena
- Names and purposes of components common to surface, surbmarine and mine sonars
- Technique and purpose of aligning sonar equipment
- Effects of water conditions on sonar operation
- Characteristics and effects of jamming and evasive devices on sonar operations

- How to operate sonar equipment in antisubmarine operations
- How to use sonar to track a target and determine its bearing drift (changes in direction off its course)
- How to recognize and classify contacts
- Submarine maneuvering characteristics
- How to compute signal-to-noise ratio
- External and internal causes of signal degradation
- Purpose, principles and adjustment of underwater fire control mechanisms
- How to test and operate underwater fire control equipment
- Theory and techniques needed to repair electrical, electronic and mechanical units, using hand tools, portable power tools, and special testing equipment; use of schematic diagrams in making repairs
- Safety precautions, such as use of rubber mats and grounding straps when working with electrical power tools and electronics equipment; safe methods of making adjustments on energized or "live" electrical and electronic equipment; methods of handling deenergized equipment to avoid getting shocked by residual electricity; methods of handling radioactive and cathode ray tubes; first-aid techniques including how to rescue a person in contact with a live circuit, how to revive someone who is unconscious from electrical shock and how to treat electrical and chemical burns.

This list does not cover everything Sonar Technicians learn; its purpose is just to give an idea of the kinds of skills and knowledge they acquire in the Navy.

## EMPLOYMENT OPPORTUNITY

There are approximately 5,650 personnel performing work in the Sonar Technician rating, of whom about 5,200 are rated petty officers. Shortages exist and opportunities are excellent for qualified applicants.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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## STEELWORKER *

Steelworkers rig and operate all the special equipment used to move or hoist structural steel, structural shapes, and similar materials. They erect or dismantle steel bridges, piers, buildings, tanks, towers, and other structures. They place, fit, weld, cut, bolt and rivet steel shapes, plates and built-up sections used in the construction of overseas facilities.

In performing their work, Steelworkers use blueprints, drawings and sketches. They learn procedures for making sketches for rigging or steelworking. They also use a variety of steelworker tools and equipment such as pneumatic hammers, drills, wrenches, tongs, forges and welding equipment.

Steelworkers lay out and fabricate structural steel in accordance with plans and specifications. They also bend and fix in place reinforcing steel for a variety of structures. Steelworkers fabricate and erect pontoons and pontoon structures. They also service, maintain and repair the heavy and light equipment they use in performing their work.

Safety is a major consideration in the Steelworker rating. Steelworkers learn and practice the precautions necessary wnen working with heavy equipment and power tools. They also learn first-aid fundamentals particularly as they apply to the treatment of injuries.

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* Although Steelworkers are not usually assigned to ships, they are involved in some of the general work of the Navy as well as the work of their own rating. It is very important for each sailor to understand the general work of the Navy as well as the work of his or her own rating or occupation. The first chapter of this manual describes the general work of the Navy.

## WORKING CONDITIONS

Steelworkers are assigned to naval shore activities, both in the United States and overseas, and to mobile construction battalions. In the United States, they are assigned to construction schools, naval construction battalion centers, amphibious bases, or to public works departments at other shore stations. Much of their work is performed out of doors in weather good or bad, and some of their work is performed in high places.

## QUALIFICATIONS

Steelworkers must have physical strength, ability to work in high places, mechanical aptitude and knowledge of practical arithmetic. Courses in sheet metal, machine shop and foundry, and experience in construction work are helpful but not required.

## TRAINING PROVIDED BY THE NAVY

Steelworkers acquire their skills through on-the-job training and self-study using Navy correspondence courses and training manuals, and through attendance at Navy service schools. Training covers such topics as:

- Types and shapes of structural and reinforcing steel including common dimensions, shapes, gages and weights; physical and chemical characteristics of steel and principles and procedures of structural steel layout
- Various methods of moving and hoisting steel and the characteristics of the hoisting equipment used
- Methods and procedures of assembling and launching pontoon structures
- Welding techniques
- Use of various steelworking tools
- Practical mathematics and the use of blueprints, drawings and sketches
- Safety and first-aid procedures and techniques

## EMPLOYMENT OPPORTUNITY

There are approximately 900 men and women performing work in the Steelworkers rating, of whom about 600 are rated petty officers. Opportunities exist for qualified applicants.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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## STOREKEEPER *

### NATURE OF THE JOB

Storekeepers are the Navy's supply clerks. Large quantities of supplies are needed to operate the Navy's many activities. Storekeepers are responsible for making sure that the needed supplies are available. These personnel are in charge of clothing, machine parts, tools, paper, forms, office materials and machines, maintenance materials, furniture, linens, food, and other kinds of materials and equipment used by Navy personnel.

The job of Storekeeper includes duties like those of civilian workers such as warehousemen, shipping clerks, purchasing agents, invoice control clerks, stock clerks and stockroom supervisors, inventory clerks, parts clerks, retail sales clerks, buyers, store managers, bookkeepers, and even fork lift operators. (A fork lift is a type of heavy, motor-powered equipment used to pick up and move heavy articles, boxes and crates.)

Storekeepers order supplies depending on needs and the money available, and they inspect incoming orders. They issue supplies, charge them to the proper Navy departments, and crate them for shipping when necessary.

Storekeepers also receive and inspect supplies that are returned because they are no longer needed. Sometimes returned supplies are in need of repair. Storekeepers see that repairs are made and return reusable supplies to storage.

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* Each Storekeeper is involved in the general work of the Navy as well as in the work of his or her own "rating" or occupation. It is very important for each sailor to understand the general work of the Navy as well as the work of his or her own rating. The first chapter of this manual describes the general work of the Navy.

Storage is a major area of responsibility for Storekeepers. They plan how storage areas should be organized, taking into account such things as the sizes of items, how often they are requested, and special storage requirements such as cool temperature and low humidity. Some supplies, such as foods, combustible materials, and hazardous chemicals, must be protected by special packaging; and some have a limited shelf life (that is, they must be used within a certain period of time because they deteriorate).

Recordkeeping and accounting also are important in this job. Storekeepers take inventory so they will always know how much stock they have on hand. They keep track of the demand for different kinds of supplies so that reorders can be made in time. They also keep accurate accounting records to ensure that budget requirements are met and that money is not overspent.

Storekeepers assigned to the larger Navy facilities may learn to use computer systems for keeping track of stocks and expenditures.

Preparation of forms and correspondence is another kind of paperwork done by Storekeepers. For example, they prepare invoices and bills of lading (forms that state the contents and value of a shipment). They prepare order forms, requisitions and vouchers for payment. They prepare forms to report damaged shipments and "short shipments" (shipments in which some items are missing).

## WORKING CONDITIONS

Storekeepers are assigned to ships or to shore stations in the United States and overseas. When on shore duty, they usually work at supply depots (shipping and receiving points), supply centers (where goods are issued and stored), and supply offices (where most of the recordkeeping, accounting, and other administrative work related to supplies is done).

### Sea-Shore Rotation

Storekeepers spend approximately 10-12 years on "sea duty" during a 20-year period in the Navy. "Sea duty" includes all of the time during which a sailor is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home.

The remaining 8-10 years of a 20-year period in the Navy will be spent on "shore duty," duty at permanent shore locations where the Storekeeper will provide support for fleet units.

- Since Navy women do not serve aboard combatant ships, women in this rating generally work at shore facilities in the United States and overseas.

## QUALIFICATIONS

Storekeepers need good general learning ability and good practical math skills. They also need to be able to write or print legibly. Helpful preparation includes courses or experience in English, typing, bookkeeping, accounting and business arithmetic, and in office procedures and the use of office machines. However, no training or experience before joining the Navy is required to qualify for the job of Storekeeper.

## TRAINING PROVIDED BY THE NAVY

Candidates for the job of Storekeeper learn from experienced personnel on the job and study Navy training manuals on their own. Candidates may also attend service schools for training. The basic training topics include procedures for store operation; how to prepare requisitions, invoices, vouchers, etc.; accounting and recordkeeping procedures; general storekeeping on ships; operation of clothing and small stores; food provisions; correspondence preparation; typing and the use of office machines.

The following list gives more specific examples of the kinds of skills and knowledge Storekeepers gain in the Navy:

- How to determine needs for supplies at shore stations and for ships departing on cruises
- Use of appropriations and funds; how to interpret and report budget data
- Procedures for inventory management including purposes of different kinds of stock records and how to document use of materials; maintenance control and cost documentation procedures; procedures for managing consumables, materials with limited shelf life, high value materials and materials that must be safeguarded for national security reasons
- Purposes and uses of automatic data processing (ADP) equipment in supply operations; common ADP terminology; how to use ADP systems for supply control and recordkeeping
- Safe handling and storage procedures for use with hazardous materials; safety procedures for loading and unloading equipment and materials on ships and ashore.

## EMPLOYMENT OPPORTUNITY

There are approximately 8,700 men and women performing work in the Storekeeper rating, of whom about 7,250 are rated petty officers. Opportunities exist for qualified applicants.

ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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## TORPEDOMAN'S MATE *

### NATURE OF THE JOB

Torpedoman's Mates maintain underwater explosive missiles, such as torpedoes and rockets, that are launched at specific targets from surface ships, submarines and aircraft. Torpedoman's Mates also maintain the launching systems used to fire underwater explosives. In addition, these personnel are responsible for the safe shipping, loading, unloading and storage of torpedoes and rockets.

Rockets, torpedoes, and their launching systems, include electrical and electronic equipment. Thus Navy Torpedoman's Mates are specialists in electrical and electronic repair. Therefore, their job is a lot like the job of electrical or electronic equipment repairmen. They just work on equipment used for different purposes and work in different environments. Torpedoman's Mates also work on mechanical and steam torpedo systems.

The weapons maintenance and repair duties of a Torpedoman's Mate include testing and replacing cables and relays, lamps, fuses and tubes, electronic modules, module cards, assemblies, switches and various circuit-checking units. They locate defects in subassemblies or parts of torpedo circuits; they inspect and replace brushes on torpedo-rotating electrical machinery such as motors or generators; they perform electrical and electronic

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* Each Torpedoman's Mate is involved in the general work of the Navy as well as in the work of his or her own rating "or occupation". It is very important for each sailor to understand the general work of the Navy as well as the work of his or her own rating. The first chapter of this manual describes the general work of the Navy.

circuit tests, make the required adjustments and replace components. They also measure electrical quantities such as voltage, current, and power and compare the results with standards; and analyze defects in test equipment and decide what adjustments or repairs are needed. Finally, they conduct prefiring tests to make sure that completely assembled torpedoes and rockets will perform according to specifications.

In their work on mechanical and steam torpedo systems, Torpedoman's Mates maintain, repair and test engines, turbines, valves, propeller mechanisms and exploder mechanisms. They check and replenish fuel, air and water supplies in torpedoes and overhaul, adjust, balance and test torpedo gyros (a gyro is a spinning mechanism that helps to keep a torpedo on course toward its target after firing).

Torpedoman's Mates also operate, analyze defects and repair equipment used to launch torpedoes and rockets, including surface and underwater launchers.

In preparing weapons for shipment, Torpedoman's Mates install accessories and install weapon components in containers. They make sure the proper packing materials are in place and put in dessicants (materials that control moisture within the containers). They also serve as team members and supervisors in loading and unloading weapon components.

Torpedoman's Mates inspect weapon storage areas daily, keeping records of temperatures in the storage areas. They also regularly inspect and test storage area sprinkler systems, cooling and ventilation systems, and alarm systems.

Administrative duties include inventorying and ordering parts, tools and other working materials. Torpedoman's Mates also maintain records on underwater weapons systems — histories of their performance, repairs made and current status. In addition, each shop has a set of technical manuals which describe the theory, testing, operation and repair of underwater weapons systems in detail. Torpedoman's Mates keep these manuals up to date by adding or changing information and they recommend changes to the procedures in the manuals based on their experience in testing and repairing the equipment.

## WORKING CONDITIONS

Torpedoman's Mates are assigned to surface ships, submarines or submarine tenders. Ashore, Torpedoman's Mates work at aviation facilities or in torpedo repair shops. Their work is generally hazardous as it involves working with explosives and much emphasis is placed on teamwork and safety.

### Sea-Shore Rotation

Torpedoman's Mates spend approximately 10-12 years on "sea duty" during a 20-year period in the Navy. "Sea duty" includes all of the time during which a sailor is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home.

The remaining 8-10 years of a 20-year period in the Navy will be spent on "shore duty" duty at permanent shore locations where the Torpedoman's Mate will provide support for fleet units.

Since Navy women do not serve aboard combatant ships, women in this rating generally work at shore facilities in the United States and overseas.

## QUALIFICATIONS

Torpedoman's Mates must have high aptitude for electrical and mechanical work, in addition to good general learning ability. There is no requirement for training or experience before joining the Navy. It is helpful preparation, however, to take courses in electricity, machine shop, welding, mechanical drawing and practical mathematics. Experience in auto repair, small parts assembly, and radio and TV repair also is helpful, but not essential.

## TRAINING PROVIDED BY THE NAVY

Candidates for Torpedoman's Mate are trained in special Navy schools. If they are to be assigned to surface ships or submarines, their training is directed mostly to the use of torpedoes and rockets. Candidates who will be assigned to weapon preparation jobs ashore receive training in electricity and electronics and then learn to apply that knowledge in testing, repairing and maintaining weapons.

The following list gives examples of specific skills and knowledge a Torpedoman's Mate can gain in the Navy:

- How to locate and identify all components, assemblies and subassemblies of a torpedo, using drawings and diagrams
- How to locate and identify all components of torpedo-launching equipment including mounts, tubes, and launchers, using drawings and diagrams
- How to assemble and operate torpedoes including assembly and operation of electrical and electronic systems; engines, fuel, air, and water systems, warheads, exploders, booster rockets and detonators

- How to control firing depth; action of mechanical and electrical firing mechanisms and firing circuits used in depth charges
- What to do if a torpedo is activated accidentally
- Basic electricity, electronics and acoustics including procedures for operating, testing and replacing cables, relays, coils, lamps, fuses, tubes, resistors and capacitors, transistors, switches, and various kinds of electrical and electronic test equipment; circuit testing and repair; types, structure and electrical characteristics of batteries; laws of magnetism as applied to underwater weapon systems; methods of calculating current, voltage, power and resistance in series and parallel circuits; electrical soldering materials and techniques; types of insulating materials and varnishes used with electrical equipment; electrical and physical characteristics of electric motors and generators; and torpedo guidance systems including inertial systems and gyros
- How to test, repair, adjust and install exploder mechanisms
- How to purge, fill, bleed and charge pneumatic and hydraulic systems associated with torpedo launching systems
- Use of power tools, hand tools, lubricants, preservatives and cleaning materials in maintaining torpedoes and related equipment
- Maintenance and repair of tools and test equipment
- Types and methods of operating cooling, ventilating, sprinkling and alarm systems in weapon storage areas.

In addition, extensive safety training is required for this job since safety is an extremely important consideration in virtually every task a Torpedoman's Mate does.

The list given here is not complete. It just gives an idea of the kinds of things Torpedoman's Mates learn through study and experience in the Navy.

## EMPLOYMENT OPPORTUNITY

There are approximately 3,900 men and women performing work in the Torpedoman's Mate rating, of whom about 3,400 are rated petty officers. Opportunities exist for qualified applicants.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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## TRADEVMAN *

Tradevmen install, operate, maintain and repair training aids and training devices. In addition to these mechanical functions, they train instructors in the operation and use of this equipment. Through the use of their training aids and devices, they also train Navy personnel in such fields as gunnery, aviation, navigation, seamanship, communications, engineering, ship and aircraft tactics, recognition of ships and aircraft, and in electronics. Some of the aids used are slide and film projectors, tape and other recording devices, flight engineer's panels, cockpit and flight simulators, and carrier landing simulators.

Among their specific duties, Tradevmen install and perform electrical and mechanical repairs including disassembling, cleaning, assembling, troubleshooting, lubricating and testing training aids and devices. They remove, check, calibrate and reinstall electrical and mechanical instruments used in training devices; and they perform classroom demonstrations, deliver lectures, prepare progress reports and maintain operating records of training devices.

In performing their work, Tradevmen use a variety of hand tools and use working drawings, blueprints and wiring diagrams for troubleshooting and installing equipment.

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* Each Tradevman is involved in some of the general work of the Navy as well as in the work of his or her own "rating" or occupation. It is very important for each sailor to understand the general work of the Navy as well as the work of his or her own rating. The first chapter of this manual describes the general work of the Navy.

## WORKING CONDITIONS

Tradevmen are assigned to Naval schools, training centers and Naval air stations where training devices are used.

### Sea-Shore Rotation

Sea-duty for Tradevmen does not consist in serving aboard ship as it does for most other ratings since there are no requirements for Tradevmen aboard ship. There are, however, certain billets at overseas bases which are considered to be sea-duty assignments, and Tradevmen may serve in such billets for about six years during a twenty-year period in the Navy.

## QUALIFICATIONS

Tradevmen must have above average general learning ability, clear speaking voices and knowledge of practical arithmetic. Courses in mathematics, physics, electricity, electronics and shop work are helpful but not required.

## TRAINING PROVIDED BY THE NAVY

Tradevmen acquire their skills through on-the-job training and self-study of Navy training manuals and correspondence courses and through attendance at Navy service schools. Training covers such subjects as:

- Principles of instruction
- Principles and applications of basic physics
- Computer basics
- Flight theory and performance
- Navigation
- Flight simulator operations and maintenance
- Operation, maintenance and repair of training devices
- Principles of electricity and electronics
- Operation, service and test of basic electronic circuits
- Use of workshop drawings, blueprints, wiring diagrams and schematic diagrams for servicing and installing equipment
- Use of hand tools and test equipment.

## EMPLOYMENT OPPORTUNITY

There are approximately 1,600 men and women performing work in the Tradevman rating, of whom about 1,400 are rated petty officers. Opportunities exist for qualified applicants.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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# UTILITIESMAN *

## NATURE OF THE JOB

Utilitiesmen plan, supervise and perform tasks involved in the installation, operation, maintenance and repair of plumbing, heating, steam, compressed air and fuel storage and distribution systems; water treatment and distribution systems; air conditioning and refrigeration equipment, and sewage collecting and disposal facilities.

In the course of their work, Utilitiesmen use a variety of hand and power tools including portable electric and pneumatic power tools, pneumatic pavement breakers, machine-powered hammers, power driven sewer cleaning mahines, winches, hoists and metal cutting and bending machines. They also use a variety of test equipment such as ohmeters, wattmeters and voltmeters.

Utilitiesmen read and work from shop drawings, sketches, construction drawings and specifications. They also make simple free-hand sketches. From drawings and specifications, they also prepare equipment, manpower and material estimates for installation and construction projects.

Boiler maintenance and repair is an important part of the work of Utilitiesmen. They clean and adjust burners, set and adjust valves, clean the inside surfaces in the boilers and replace brickwork. They also test boiler water for chlorine content.

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* Although they do not usually work aboard ships, Utilitiesmen are involved in some of the general work of the Navy as well as in the work of their own "rating" or occupation. It is very important for each sailor to understand the general work of the Navy as well as the work of his or her own rating. The first chapter of this manual describes the general work of the Navy.

Other duties include installing and repairing pumps, compressors, tanks, filters, valves, gages and pipes.

Working with electrical and heavy mechanical equipment makes safety a matter of major concern for Utilitiesmen. As a result, they study, practice and instruct their fellow workers in safety precautions and in standard, safe-operating procedures. They also learn first-aid procedures and techniques.

## WORKING CONDITIONS

Navy Utilitiesmen are assigned to naval shore activities, both in the United States and overseas, and to mobile construction battalions.

In the United States, they are assigned to construction schools, naval construction battalion centers, amphibious bases or to public works departments at other shore stations.

## QUALIFICATIONS

Utilitiesmen must have good learning ability and mechanical aptitude. School or apprentice training in plumbing and related fields, as well as mathematics, are helpful but not required. Also helpful is experience in steam or diesel engineering and in water supply and sanitary engineering.

## TRAINING PROVIDED BY THE NAVY

Utilitiesmen acquire their skills through attendance at Navy service schools and through on-the-job training coupled with study of Navy correspondence courses.

Training is provided in such subjects as:

- Mathematics
- Blueprint reading
- Heat cycles, heat exchangers and refrigeration
- Principles, operation and repair of various auxiliary machinery such as condensers and evaporators
- Installation, operation and repair of gasoline and diesel engines, compressors and pumps
- Sewage disposal and treatment
- Water sources and water purification techniques

- Plumbing procedures and techniques
- Functions and operation of stationary steam boilers
- Safety precautions.

## EMPLOYMENT OPPORTUNITY

There are approximately 1,300 men and women performing work in the Utilitiesman rating, of whom about 850 are rated petty officers. Opportunities are limited except for highly qualified applicants.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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# YEOMAN *

## NATURE OF THE JOB

Yeoman perform secretarial and clerical work. They receive visitors, telephone calls and incoming mail. They type, organize files and operate duplicating equipment such as mimeographs and Xerox machines. They also order and distribute supplies.

More specifically, Yeomen do such things as write and type business and social correspondence, notices, and directives (general orders from officers in charge), forms and reports. They type from both written and recorded dictation. They prepare material for mailing and log in mail as required. Yeomen maintain files and officer service records, making sure that new information is added to the records and that needed changes are made. They gather information for manpower reports and other kinds of reports and they verify data contained in reports by checking them against service records. Yeomen also are responsible for performing routine maintenance on typewriters and duplicating machines. (For example, they use solvents to remove carbon buildup from type face, they wipe away dust and oil from the typewriter mechanism and adjust the striking force of the keys or other printing mechanisms.)

In the higher pay grades Yeomen may be stenographers and office managers and they may specialize in legal clerical work. (Yeomen who go into legal work are called Legalmen. That career specialty is described separately.)

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* Each Yeoman participates in the general work of the Navy as well as the work of his or her own "rating" or occupation. It is very important for each sailor to understand the general work of the Navy as well as the work of his or her own rating. The first chapter of this manual describes the general work of the Navy.

## WORKING CONDITIONS

Yeoman work in offices aboard ships and at naval bases, naval air stations and at other naval facilities in the United States and overseas.

### Sea-Shore Rotation

Yeoman spend approximately 8-10 years on "sea duty" during a 20-year period in the Navy. "Sea duty" includes all of the time during which a sailor is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home.

The remaining 10-12 years of a 20-year period in the Navy will be spent on "shore duty," duty at permanent shore locations where the Yeoman will provide support for fleet units.

Since Navy women do not serve aboard combatant ships, women in this rating generally work at shore facilities in the United States and overseas.

## QUALIFICATIONS

People interested in this job should have an aptitude for detailed work in addition to good general learning ability. Since they must work with and for many people, they also need an ability to get along easily with others.

Helpful preparation includes courses in English and business subjects—typing, stenography, office procedure, etc. Clerical experience also is helpful, but no previous training or experience is required to qualify.

## TRAINING PROVIDED BY THE NAVY

Training is given in school courses and on the job. Yeomen learn:

- Touch typing.
- Correct English grammar, punctuation, and spelling.
- How to handle classified information (that is, information that may be known only to personnel who have received a security clearance and who need the information for their work).
- How to organize different kinds of files including correspondence files and tickler files; how to set up a cross reference system. (Ticklers are files set up to show actions expected or actions that should be taken on certain dates; review of a file organized in such a way "tickles the memory".)
- General rules for composing correspondence and correspondence format; how to prepare instructions, directives and notices according to Navy standards.

- Procedures for requisitioning, storing and issuing supplies.
- Procedures for logging incoming and outgoing mail.
- Personnel administration procedures.
- How to operate office duplication equipment and dictating equipment.

Training also covers the content and use of the Navy publications that are tools in the Yeoman's work. These publications include the U. S. Navy Regulations, the Bureau of Naval Personnel Manual, the Navy Directives and Issuance System Manual, the Correspondence Manual, the Security Manual for Classified Information and the Manpower and Personnel Management Information Systems Manual.

## EMPLOYMENT OPPORTUNITY

There are approximately 10,800 men and women performing work in the Yeoman rating, of whom about 9,500 are rated petty officers. Opportunities are excellent for qualified applicants.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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# III. NAVY OFFICER OCCUPATIONS

# UNRESTRICTED LINE OFFICER*

## NATURE OF THE JOB

Over fifty percent of all naval officers belong to the Unrestricted Line category. Unrestricted Line Officers are eligible to command the Navy's operating forces -- the ships, submarines, aircraft squadrons, operational staffs and fleets -- that carry out the Navy's mission. An increasing number of Unrestricted Line Officers participate in highly specialized nuclear propulsion training programs and become qualified to serve on and command the Navy's growing number of nuclear powered submarines and surface ships. Unrestricted Line Officers also command naval bases, naval air stations, and many of the other shore units and installations that support the Navy's operating forces. Unrestricted Line Officers may also function as members of joint Army-Navy-Air Force commands and as members of allied commands. High ranking Navy Unrestricted Line Officers may have overall command of the Army, Navy, Air Force and Marine Corps forces operating in an entire area (for example: the Navy admiral who is Commander-in-Chief, Pacific, has overall command of all of the United States Forces operating in the Pacific area). The highest ranking officer in the Navy, the Chief of Naval Operations, is an Unrestricted Line Officer.

Unrestricted Line Officers specialize in one of five areas: general line duties, air warfare, surface warfare, submarine warfare, or special warfare. General line duties include administrative tasks, personnel and program management tasks, general leadership tasks, or tasks performed while undergoing training for a warfare specialty. Many women officers in the Navy participate in general line duties. Air warfare specialists function as pilots and air crew in Navy aircraft and focus their efforts on the strategy, tactics and support requirements involved in conducting naval air warfare. Similarly, surface warfare and submarine warfare specialists man the Navy's ships and submarines and focus on their particular specialties. Special warfare officers participate in such operations as explosive ordnance disposal, underwater demolition, riverine and coastal waters operations and SEAL Team (Sea, Air and Land) operations. These officers undergo highly specialized training for their unique operations.

Officers in all of these specialties share a common responsibility for providing leadership in all areas affecting the Navy's mission. As a result, they must have a general knowledge of operations, maintenance, administration, logistics and support functions. To gain such knowledge, Unrestricted Line Officers spend the first 12 to 14 years of active duty serving in sea and shore duty billets which afford them the opportunity to learn and develop the knowledge and leadership skills necessary for command. They are then selected for command of individual ships, submarines, or aircraft squadrons and for command of shore units and installations. Thereafter, they are selected for commands of increasing importance based on their leadership performance.

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* Each Unrestricted Line Officer is involved in some of the general work of the Navy as well as the work of his or her own "specialty" or occupation. It is very important for each officer to understand the general work of the Navy as well as the work of his or her own specialty. The first chapter of this manual describes the general work of the Navy.

At some point during their first 12 to 14 years of active duty, many Unrestricted Line Officers participate in postgraduate studies and earn advanced degrees. But unlike Restricted Line Officers, Staff Corps Officers and Limited Duty Officers, they do not necessarily specialize in a particular field other than their warfare specialty. They return to billets of general leadership and command. However, they may use the knowledge gained in advanced education programs when they serve on Navy, joint or allied staffs.

A number of officers in the general line group join qualified air, surface and submarine warfare specialists in nuclear power training programs. Because the nuclear propulsion field is of such growing importance to the Navy, the entry programs for newly commissioned general line officers, as well as for previously qualified air, surface and submarine warfare specialists, are discussed below.

## Entry Into Nuclear Power Programs

Air, surface and submarine warfare specialists are selected for entry into the nuclear power program by a selection process which includes record reviews and personal interviews.

Naval Academy, NROTC and Officer Candidate School students may apply for entry into the program prior to graduation. Minimal requirements in physics and calculus must have been satisifed and, if selected, entry into the nuclear power program would occur after graduation.

NESEP program participants may likewise apply for entry into the nuclear power program prior to graduation.

There are also two special entry programs:

Nuclear Propulsion Officer Candidate Program (NUPOC). The NUPOC program provides selectees with a guarantee of assignment to the nuclear power program prior to their entry into Officer Candidate School (OCS). Screening and selection of applicants, who must be college graduates with minimum qualifications in physics and calculus, are completed before entry into OCS. Candidates enter the nuclear power program after successful completion of the regular OCS curriculum. (Note that regular OCS graduates can apply for the nuclear power program, but are not guaranteed entry as are NUPOC graduates.)

Nuclear Propulsion Candidate Scholarship Program (NPCS). The NPCS program provides an opportunity for entry into the nuclear power program for college or university students in one of two categories:

a) Students who are completing their second year in a college or university that does not offer an NROTC program;

b) Students who are completing their second year in a college or university but who have not participated in the available NROTC program.

Applicants selected for the NPCS program attend a special six week course at OCS. They then receive a scholarship for the two remaining years of undergraduate study during which they participate in the NROTC program. (This may require a change of schools.)

Screening for the nuclear power program is completed before entry into the NPCS program, but candidates are not guaranteed assignment in the manner of NUPOC candidates. However, since they have successfully completed screening, the likelihood of assignment to the nuclear program is increased.

## WORKING CONDITIONS

Unrestricted Line Officers serve aboard ships of every size from submarines to aircraft carriers. Air warfare specialists fly and perform as crew members in Navy aircraft. At sea, Unrestricted Line Officers frequently work in extreme weather conditions. Often, as when on a flight deck, conditions may be very hazardous.

When ashore, Unrestricted Line Officers generally work in office settings or in shop facilities at naval bases and naval air stations.

### Sea-Shore Rotation

Most Unrestricted Line Officers begin their naval service on sea duty. In the case of naval aviators, nuclear submariners and some special warfare officers, the first part of their naval service will be spent in training in their particular specialty before joining a fleet unit. The first sea-duty tour is usually 3 to 4 years in length. A 3-year shore duty tour generally follows. Thereafter, Unrestricted Line Officers continue to rotate between sea duty and shore duty, with the normal tour being about 2-3 years in length.

"Sea duty" includes all of the time during which an officer is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home. "Shore duty" is duty at permanent shore locations, where Unrestricted Line Officers provide support for fleet units or for the Navy in general.

Since Navy women do not serve aboard combatant ships, women Unrestricted Line Officers generally rotate among shore facilities in the United States and overseas. Also women aviators fly in non-combatant aircraft.

## QUALIFICATIONS

To qualify for a commission in the Unrestricted Line category, it is necessary to have a bachelor's degree from an accredited college or university.

Depending on the specialty chosen, entry level ages vary between 19 and 30. Graduates of the Naval Academy and graduates who participate in NROTC programs while in college are commissioned after graduation. Other applicants attend Officer Candidate School after which they receive officer commissions. Candidates must meet certain physical and medical standards depending on the particular specialty they have chosen.

## EMPLOYMENT OPPORTUNITY

There are approximately 38,500 men and women Unrestricted Line Officers on active duty in the Navy. The number of new officers required each year depends on many factors. While the number of submarine applicants might be double the number of available openings, there may be a shortage of surface or aviation officers. Openings rely on such factors as the number of officers leaving the service, the number of ships in commission, or the number of ships planned for construction. However, opportunities do exist for highly qualified applicants.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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# AERONAUTICAL ENGINEERING DUTY OFFICER*
# (RESTRICTED LINE)

## NATURE OF THE JOB

Within the Aeronautical Engineering Duty Officer category, some officers specialize in aviation engineering, and others (called Aeronautical Maintenance Duty Officers) specialize in aviation maintenance management. These officers function as professional aeronautical engineers and as technical managers in every aspect of naval aircraft design, development, maintenance and support. They also play a part in helping the Navy to decide on purchases of new aircraft. They often work closely with research and development engineers from civilian agencies and firms.

Aeronautical Engineering Duty Officers must be familiar with aerodynamics, structural design, electronics, propulsion, communications and electrical systems. They must also be able to carry out important management duties related to finance, maintenance, material control and research and development. All of those management subjects are critical to assuring the efficiency of the Navy's aviation operations.

## WORKING CONDITIONS

Aeronautical Engineering Duty Officers are assigned to Navy fleet staffs, naval air stations, aircraft carriers, aircraft squadrons, headquarters offices, research and development centers and to manufacturing plants and major Navy repair facilities. Their duties in these varied situations require that they work outdoors under all weather conditions, and in a variety of indoor environments including offices, large production and maintenance shops, drafting rooms and laboratories. When working around aircraft, they may be subjected to high noise levels and to the hazards of jet engine suction and exhaust, spinning propellers and moving aircraft.

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* Each Aeronautical Engineering Duty Officer is involved in some of the general work of the Navy as well as the work of his own specialty or occupation. It is very important for each officer to understand the general work of the Navy as well as the work of his own specialty. The first chapter of this manual describes the general work of the Navy.

### Sea-Shore Rotation

Some Aeronautical Engineering Duty Officers may have begun their naval service as Navy pilots or flight officers. Thus, about the first one and a half years of service are devoted to training. After that they usually serve at sea for about three and a half years. They then may become eligible for postgraduate education. If they earn an advanced degree in an engineering or other technical field, they can apply to become Aeronautical Engineering Duty Officers. If they are selected by a board for this occupational field, they are then assigned to sea or shore duty in one of the areas mentioned above in the discussion of working conditions. Their tours of duty then follow a rotation of 3-4 years in each position until their naval service is completed.

Other Aeronautical Engineering Duty Officers may have entered the engineering or maintenance management specialties immediately after commissioning. Their rotational pattern is similar in that they rotate between sea and shore duty spending about 3-4 years in each assignment.

"Sea duty" includes all of the time during which an officer is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home. "Shore duty" is duty at permanent shore locations, where Aeronautical Engineering Duty Officers provide support for fleet units or for the Navy in general.

## QUALIFICATIONS

Aeronautical Engineering Duty Officers, who specialize in aviation engineering, must be Lieutenants or above and must have completed two or more successful tours at sea in the field of aviation. 80-90 percent of those selected are Naval Aviators (pilots). The remainder are mostly Naval Flight Officers, and a few are non-aviation officers who have significant skills related to aviation. In addition, almost all of these officers have advanced degrees. That is why most Aeronautical Engineering Duty Officers begin to seek this career pattern while they are in a graduate program at the Naval Postgraduate School or other higher education institutions.

Aeronautical Engineering Duty Officers who specialize in aircraft maintenance (Aeronautical Maintenance Duty Officers) and who seek entry into the program from civilian life, must have a bachelor's degree in engineering, science, management or administration, and must be between 19 and 27½ years old at time of commissioning. They must meet normal physical standards, pass an officer aptitude rating exam, and be selected by a board of officers.

Officers already on active duty and serving in other officer categories may apply for selection to become Aeronautical Maintenance Duty Officers. A bachelor's degree is generally required and experience in aviation maintenance is desirable. Limited Duty Officers may apply if they are below the rank of Commander. LDO Lieutenant Commanders may not have served at that rank for more than three years.

## EMPLOYMENT OPPORTUNITY

Approximately 730 naval officers are currently employed as Aeronautical Engineering Duty Officers within the two specialties, engineering and maintenance. Selection for entry into this occupation is competitive, but vacancies occur each year.

At present, women are not appointed to the Restricted Line category because laws governing promotion of women make it more desirable for women to be in the Unrestricted Line or staff corps categories. However, some Navy women officers do perform tasks associated with restricted line specialties.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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# CRYPTOLOGY OFFICER*
# (RESTRICTED LINE)

## NATURE OF THE JOB

"Cryptology" means the study of "secret language." Cryptology Officers hold positions of great responsibility and trust and specialize in secret communications using advanced electronic equipment. They direct the coding, decoding, transmission, receipt, and interpretation of information that may be vital to U.S. national defense. They do research to develop and break new codes and supervise the operation and maintenance of electronic communication equipment. They prepare reports on cryptology activities and results for authorized officials who are responsible for national defense strategy.

Cryptology Officers' work requires intensive professional training. Scientific and technical backgrounds are particularly desirable, with emphasis on electrical engineering, mathematics, physics, computer science, and data processing.

## WORKING CONDITIONS

Cryptology Officers usually work in offices or in communications centers aboard ships and at shore facilities. They may be assigned to duty overseas as well as in the United States.

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* Each Cryptology Officer is involved in some of the general work of the Navy as well as the work of his own specialty or occupation. It is very important for each officer to understand the general work of the Navy as well as the work of his own specialty. The first chapter of this manual describes the general work of the Navy.

## Sea-Shore Rotation

Assignment patterns vary depending on officers' skills and the Navy's needs. Cryptology Officers, like other Navy officers, typically change job assignments and locations every 2-3 years. During a 20-year career, a Cryptology Officer will serve at several different locations in the United States and also overseas. The officer also may be assigned to sea duty aboard ship or as a member of a staff, for particular missions or for a regular sea-duty tour.

"Sea duty" includes all of the time during which an officer is assigned to a fleet unit ( a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home. "Shore duty" is duty at permanent shore locations, where Cryptology Officers provide support for fleet units or for the Navy in general.

## QUALIFICATIONS

People who are interested in Cryptology must have a bachelor's degree from an accredited college or university. Degrees in technical subjects such as computer science or electrical engineering are highly preferred as are degrees in foreign languages. Interested persons must also be eligible for a security clearance.

A certain number of Naval Academy, NROTC and Officer Candidate School graduates are selected for the Cryptology specialty, but most members of this specialty are officers who were Unrestricted Line Officers and who desired to specialize in Cryptology.

## EMPLOYMENT OPPORTUNITY

Applicants for the Cryptology program are screened very carefully. The screening considers both professional skills and the suitability of applicants' personalities and backgrounds for highly confidential work. There are good opportunities in the Navy's Cryptology program for applicants who meet the selection criteria.

At present, women are not appointed to the Restricted Line category because laws governing promotion of women make it more desirable for women to be in the Unrestricted Line or staff corps categories. However, some Navy women officers do perform tasks associated with Restricted Line specialties.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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# ENGINEERING DUTY OFFICER*
# (RESTRICTED LINE)

## NATURE OF THE JOB

Engineering Duty Officers are both professional engineers and managers in the fields of ship design, construction, maintenance and repair and in ordnance (weapon) design, construction, maintenance and repair. They also play a key role in helping the Navy decide which ships and weapons to buy. Virtually every field of engineering is related to the work of Engineering Duty Officers. These officers must have a broad familiarity with all of the engineering subjects related to ships including naval architecture, marine engineering, and mechanical, electrical and electronic engineering. Each Engineering Duty Officer also specializes in one or a small number of more narrowly defined fields. These specialties include:

Deep ocean engineering
Salvage and diving
Underwater acoustics
Satellite communications
Hydrofoil design
Non-destructive testing
Shock and vibration
Electric power distribution
Nuclear power
Boilers
Gas turbines
Undersea surveillance

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* Each Engineering Duty Officer is involved in some of the general work of the Navy as well as the work of his own specialty or occupation. It is very important for each officer to understand the general work of the Navy as well as the work of his own specialty. The first chapter of this manual describes the general work of the Navy.

Electronic warfare
Metallurgical engineering
Lasers
Computer technology
Electromagnetic radiation
Hydraulics
Ballistics

Engineering Duty Officers also perform important management duties. Because many Navy organizations are large and rely very much on modern technology, officers are needed who can combine engineering knowhow with managerial ability. As a result, Engineering Duty Officers take active roles in industrial, maintenance, financial, material and research and development management.

## WORKING CONDITIONS

Engineering Duty Officers work in shipyards, on support and operational ships, and at management, research and educational facilities in the United States and overseas. As a result they work in a variety of conditions, performing indoor and outdoor activities aboard ships in all kinds of weather, and performing office functions, laboratory work and academic work while ashore.

### Sea-Shore Rotation

When they begin their active duty with the Navy, persons who become Engineering Duty Officers normally serve 3 or 4 years as Unrestricted Line Officers, mostly on sea duty. They then take postgraduate training of from 1 to 2 years duration at the Naval Postgraduate School or at civilian universities. Following their graduate training, they become Restricted Line Officers in the Engineering Duty community. Then they begin a normal rotation of 3-4 years at sea, followed by 3 years ashore and so on until their period of naval service ends.

## QUALIFICATIONS

The Engineering Duty Officer field is open only to persons who serve successfully as Unrestricted Line Officers during their first 3, 4 or more years with the Navy. They must have or clearly be eligible for postgraduate education, and they must have some engineering experience, preferably aboard ship during their early years in the Navy. A record of high achievement in college study is important, but a record of excellent performance as a naval officer is given even more consideration by the boards who select Engineering Duty Officers. These officers must also be physically able to stand the strain of duties afloat.

## EMPLOYMENT OPPORTUNITY

Approximately 1,400 naval officers are currently serving as Engineering Duty Officers in the Restricted Line. About 150 of them are specialists in the fields related to ordnance engineering. The remaining 1,250 officers work in fields related to ship engineering. A shortage of personnel in the Engineering Duty field has existed since 1966.

At present, women are not appointed to the Restricted Line category because laws governing promotion of women make it more desirable for women to be in the Unrestricted Line or staff corps categories. However, some Navy women officers do perform tasks associated with Restricted Line specialties.

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# GEOPHYSICS OFFICER*
## (RESTRICTED LINE)

## NATURE OF THE JOB

Geophysics Officers are environmental scientists. They specialize in analyzing and interpreting sea and atmospheric conditions.

Geophysics work in the Navy brings together two major areas of environmental science: meteorology (the study of atmospheric conditions) and oceanography (the study of sea conditions). More and more, those sciences are being combined. It is necessary to look at the interaction of atmosphere and sea to predict weather accurately. Navy Geophysics Officers generally are trained in both oceanography and meteorology.

The job of forecasting atmospheric and sea conditions involves mostly numerical analysis. Some data are obtained by visual observation, but most data are provided by advanced instruments. Data about the atmosphere are provided by sensors on weather satellites and by radars at ground stations. Weather sensors are also placed on buoys at sea, and ship sonars provide information about the sea. (Sonars may be thought of as undersea radars. They are instruments that transmit and receive sound waves under water. The characteristics of the sound waves, such as speed, dispersion, deflection, give indications about underwater conditions.) All of these instruments transmit to ground stations, called Fleet Weather Centrals where the data are fed into computers. Fleet Weather Centrals are located at Monterey, California; Pearl Harbor; Guam; Rota, Spain; and Norfolk, Virginia. Their computer systems are linked to provide a continuous exchange of information, in numerical form, about the atmosphere and sea states all over the world. Smaller weather stations receive data from them. Geophysics Officers analyze computer printouts from Weather Centrals, along with other information, and prepare forecasts for the areas to which they are assigned. They update forecasts regularly and prepare weather maps and charts.

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The reports of Geophysics Officers are used to plan and change plans for the operations of Navy aircraft and ships, for antisubmarine warfare maneuvers, and for the firing of weapons such as missiles and torpedoes. The reports are used by ships' personnel and flight personnel as well as commmand headquarters. Thus Geophysics Officers have important responsibilities for human safety and successful Navy operations. Geophysics Officers also have routine weather forecasting duties. They often coordinate regular local and regional forecasting with the civilian weather service.

In addition, Geophysics Officers may conduct research to improve techniques of gathering and analyzing data about atmospheric and water conditions. Research work may involve design and modification of equipment or instruments, development of computer programs for processing data, and development of new techniques for analysis and forecasting.

Geophysics Officers supervise enlisted Aerographer's Mates and other personnel who work in the weather field. Periodically, Geophysic Officers may be assigned to jobs that are primarily managerial. In assignments of that kind they may be responsible for planning geophysics activities, for planning and directing training, for assigning personnel to jobs and for screening new applicants, for estimating costs of the Geophysics program and for preparing budgets.

## WORKING CONDITIONS

Geophysics Officers may be assigned to any of the Fleet Weather Centrals, or to naval air stations or other facilities in the United States and overseas. They may also be assigned to sea duty with, for example, an amphibious assault ship or an aircraft carrier. Typically, Geophysics Officers work in office spaces and instrument rooms.

### Assignment Pattern

The pattern of duty assignments for Geophysics Officers is flexible. However, the following is typical. Ensigns just entering the Navy as Geophysics Officers usually serve their first tour of duty at one of the Fleet Weather Centrals overseas. The overseas assignments offer more opportunity to gain experience with the operating fleet. The first tour may last from 15 months to about $3\frac{1}{2}$ years. Personnel who have decided to stay in the Navy and who have gained enough expertise in operational forecasting usually are sent to the Naval Postgraduate School at Monterey, California, for their second tour. In that tour they complete a Master's degree or other advanced program in their field, which usually takes about two years. Then they go to another Weather Central assignment for about 1-3 years. After that, assignments vary—sea duty, Weather Central, any of the smaller weather facilities, a naval air station, postgraduate school as an instructor, etc.

"Sea duty" includes all of the time during which an officer is assigned to a fleet unit ( a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home. "Shore duty" is duty at permanent shore locations, where Geophysics Officers provide support for fleet units or for the Navy in general.

## QUALIFICATIONS

Candidates must have a Bachelor's degree in mathematics, physics or one of the other physical sciences. Then they must attend Officer's Candidate School. A good academic record is important, since only a few new people are selected for the Geophysics program each year.

It is possible for regular Navy officers to transfer into the Geophysics specialty. They may do so if they have or obtain the required undergraduate academic training and gain experience in the geophysics field during their service.

## EMPLOYMENT OPPORTUNITY

There are currently 191 Geophysics Officers in the Navy. It is not easy to get into the program, but people with excellent academic records and strong interest do have good opportunities for selection. The Navy encourages such candidates to apply.

The competition is keen because the program is small. The number of openings may change depending on the developments in the geophysical sciences and on the Navy's needs.

At present, women are not appointed to the Restricted Line category because laws governing promotion of women make it more desirable for women to be in the Unrestricted Line or staff corps categories. However, some Navy women officers do perform tasks associated with Restricted Line specialties.

ADDITIONAL INFORMATION

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# INTELLIGENCE OFFICER*
# (RESTRICTED LINE)

## NATURE OF THE JOB

Naval Intelligence units provide Navy planners and command personnel with information about the size, strength, location and movement of the military forces of other nations throughout the world. Intelligence information is used in planning the movement of U.S. naval forces and in developing strategy and tactics for naval operations.

Intelligence Officers are primarily researchers and analysts. They analyze numerical data and they interpret aerial photographs, surface photographs, and radar and sonar feedback. They prepare maps, charts, tables, graphs and narrative reports. They also supervise technicians who operate the advanced electronic equipment used to gather intelligence data.

Normal duties of a newly-commissioned Intelligence Officer include maintaining charts that show the locations of U.S. forces and those of other nations; briefing pilots and senior officers on the current status of forces around the world; supervising computer facilities where intelligence data are processed; and maintaining escape and evasion plans.

Many assignments require that a person be able to think and act quickly. Intelligence personnel must be able to present their analyses so that commanding officers can grasp the general picture quickly and can easily pick out important information. To accomplish this, extensive research, analysis and attention to minute detail are often required.

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## WORKING CONDITIONS

. Navy Intelligence Officers work in a variety of settings which may include aircraft carriers, squadrons, fleet staffs, or overseas naval staffs. A number of positions involve major staff duty in the Washington, D.C. area. Many of these billets are on joint staffs where Naval Intelligence Officers work with officers of other services in direct support of the Joint Chiefs of Staff. Much intelligence collection work also may be done by officers on attache duty or serving as advisors overseas. These positions may involve liaison and/or joint intelligence activities with foreign naval forces.

### Assignment Pattern

The prospective Intelligence Officer is required to agree to serve four years total active duty as opposed to the normal three-year tour of duty. Prospective candidates are selected to attend either Officer Candidate School at Newport, Rhode Island, or Naval Air Officer Candidate School at Pensacola, Florida. Upon commissioning, the Intelligence Specialist Ensign can anticipate spending most of his first year in a training program. This training is normally followed by a two-year tour of duty as either the Air Intelligence Officer of a Navy squadron or as an Assistant Intelligence Officer on an aircraft carrier or other ship. Subsequent tours may include overseas or continental USA staff positions (including Washington, D.C. headquarters billets).

Newly commissioned officers can indicate preference of assignment and location. Preferences are matched with availability of assignments and extent of training and experience. Exposure to various types of Intelligence assignments is desired to make an officer more valuable to the Navy and to enhance promotional opportunities.

Tours of duty are usually 2-3 years in length, and Intelligence Officers can expect to rotate between shore duty and sea duty assignments.

"Sea duty" includes all of the time during which an officer is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home. "Shore duty" is duty at permanent shore locations, where Intelligence Officers provide support for fleet units or for the Navy in general.

## QUALIFICATIONS

College graduates who meet the following qualifications are eligible for Navy Intelligence positions:

- Citizen of the United States
- Between 19 and $27\frac{1}{2}$ years of age (additional credit is given for prior enlisted service)
- Good physical health, including normal color and depth perception, and visual acuity of not less than 80% correctable to 100%
- Bachelor's degree from a regionally accredited college or university with a "B" average.

## EMPLOYMENT OPPORTUNITIES

There are approximately 1100 positions for Naval Intelligence Officers. The number of openings fluctuates, depending on the needs of the Navy. Once selected, however, opportunities for promotion are good.

At present, women are not appointed to the Restricted Line category because laws governing promotion of women make it more desirable for women to be in the Unrestricted Line or staff corps categories. However, some Navy women officers do perform tasks associated with Restricted Line specialties.

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## PUBLIC AFFAIRS OFFICER*
## (RESTRICTED LINE)

### NATURE OF THE JOB

Public Affairs Officers (PAOs) are professionals in the field of public relations. Their work includes the three major public relations specialties:

- Community relations (with the public)
- Media relations (with the press, radio, and television)
- Internal relations (with Navy personnel, their families, retired, and Reserve).

As community relations specialists, PAOs work to maintain understanding and good rapport between the Navy, the general public, and the people of the communities in which Navy facilities are located. PAOs keep in touch with community leaders and officials. They prepare information for the public and plan how to get information to people most effectively. They write speeches and schedule speaking engagements by naval personnel. They may also give talks, speeches, and do other kinds of public appearance work themselves. They plan open-house programs, tours, exhibits and demonstrations of Navy activities. For example, PAOs schedule and publicize ship tours and arrange performances by the Navy's flight demonstration team, the Blue Angels.

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As media relations specialists, PAOs maintain contact with professionals in the civilian press, radio and television. They provide information about the Navy to the media, prepare news releases and plan television appearances and radio broadcasts in which naval personnel participate.

As internal relations specialists, PAOs work as journalists, commentators and managers for the Navy's newspapers and the armed forces radio and television stations. They prepare newsletters and other publications for Navy personnel and their dependents, for the civilian employees of the Navy, members of the Naval Reserve and retired Navy personnel. They help prepare recruiting materials including brochures, films and in-person presentations.

In general, PAOs in the Navy do the same kinds of work as is done by civilian public relations specialists in government, in business, in schools and in the media. The main difference is probably that Navy PAOs are required to do all kinds of public relations work. There is a lot of overlap in the specialty areas just described, and Navy PAOs may specialize in more than one area.

PAOs may be managers as well as professional specialists. They supervise enlisted personnel and others involved in Navy public affairs work. They plan public affairs programs and budgets and evaluate results.

## WORKING CONDITIONS

There are variety of assignments for Public Affairs Officers in the Navy. PAOs may be assigned to commands throughout the United States and overseas and to sea duty, usually on large ships or as members of staffs.

"Sea duty" includes all of the time during which an officer is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home. "Shore duty" is duty at permanent shore locations, where Public Affairs Officers provide support for fleet units or for the Navy in general.

A large number of senior public affairs assignments are in the Washington, D. C. area on staffs in the Department of Defense and in the Navy Department. There are also senior/junior officer requirements in major U.S. cities.

### Assignment Pattern

There is no set pattern for assignment changes. A tour of duty lasts from 1-3 years, and PAOs usually change jobs and locations after one or two tours. It can be said that in a 20 year career, a PAO will work in several major cities in the United States and will serve at least one (probably more than one) tour overseas.

## QUALIFICATIONS

Candidates for Public Affairs Officer must have an undergraduate degree in one of the following: public relations, journalism, mass communications, radio/television broadcast, photojournalism, cinematography, advertising, or marketing. A Navy PAO must have a basic education in the tools of one of those disciplines, an understanding of the forces that affect today's society, and the ability to address problem solving in a communications environment.

Personnel enter the Public Affairs Officer Program through the Change-of-Designator Program. That means they first work in another officer category and then transfer to the Public Affairs program. PAOs usually have served an initial tour of duty in the Unrestricted Line. They may apply for designation as a Public Affairs Officer after promotion to the grade of lieutenant-junior grade. Selection is competitive. PAOs are chosen based on their educational background, professional experience, performance of duties, and public affairs experience gained while serving in the Unrestricted Line.

In addition to the formal qualifications, candidates for Public Affairs Officer need excellent writing and speaking skills. They should be good at establishing relationships with other people of all kinds. They should enjoy working with words and ideas as well as people. In most cases, they will need talent in the area of visual display or graphics.

## EMPLOYMENT OPPORTUNITY

Public Affairs is currently the smallest officer specialty in the Navy. There are now 160 PAOs. People who enter the public affairs specialty tend to stay in the Navy for a full 20 year career. Since there is little turnover, relatively few openings occur each year. An increase in openings will depend on increased need in the Navy for public affairs work.

Thus the position of Public Affairs Officer is highly competitive. It is restricted to people with excellent educational background and successful experience in the field.

At present, women are not appointed to the Restricted Line category because laws governing promotion of women make it more desirable for women to be in the Unrestricted Line or staff corps categories. However, some Navy women officers do perform tasks associated with Restricted Line specialties.

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# CHAPLAIN CORPS OFFICER *

## NATURE OF THE JOB

Navy Chaplains are commissioned officers who are qualified ministers, priests and rabbis representing their respective faiths. They have already received the education and professional training required of their denomination. Many facets of this ministry are similar to the work performed by civilian ministers. Navy Chaplains arrange and officiate at religious services and counsel individuals or groups on religious or personal matters. They may also help organize programs related to the specific needs of individuals or groups of service personnel.

A Navy Chaplain must attend to the religious needs of a broader group of people than would the civilian religious leader. For example, a Protestant Chaplain when serving alone on a ship is responsible for arranging worship opportunities for shipmates of all faiths. The Chaplain also must be aware of official Navy policies and procedures in order to counsel individuals effectively in such areas as conscientious objection, drug abuse and hardship discharges.

## WORKING CONDITIONS

Navy Chaplains work in church, chapel and office settings. The normal career pattern includes a variety of assignements within the continental United States, overseas, or at sea. Duties may be performed at training centers,

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aboard ships, in hospitals, at air stations, at naval bases and at overseas facilities. Navy Chaplains may also be assigned to tours of duty with Marine Corps Divisions or with the U.S. Coast Guard.

## Assignment Pattern

While on active duty, Navy Chaplains rotate between "sea duty" aboard large navy ships or with staffs, and "shore duty" at naval shore facilities throughout the world. Tours are approximately 2-3 years in length.

"Sea duty" includes all of the time during which an officer is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home. "Shore duty" is duty at permanent shore locations, where Navy Chaplains provide support for fleet units or for the Navy in general.

Since Navy women do not serve aboard combatant ships, women in the Chaplain Corps rotate among shore facilities in the United States and overseas.

## QUALIFICATIONS

A person is eligible for appointment in the Chaplain Corps, U.S. Naval Reserve, for active or inactive duty, if he or she:

- Is endorsed by an ecclesiastical endorsing agency recognized by the Armed Forces Chaplain's Board.
- Is between 21 and 39 years of age at the actual time of appointment (the upper age limit may be increased for veterans).
- Is a citizen of the United States.
- Is physically qualified.
- Possesses 120 semester hours undergraduate credits (or equivalent) from an accredited college or university.
- Possesses a Master of Divinity degree (or an equivalent theological degree) or has received credit for completing 90 semester hours of graduate study in theology or related subjects from an accredited theological school (semester hours received from a non-accredited institution but which are accepted as transfer credit by an accredited institution are also acceptable).

All initial appointements in the Chaplain Corps are in the Naval Reserve. Applications are accepted for both active and inactive duty. Inactive duty chaplains may apply for active duty at any time. Applicants for active duty must have permission from officials of their denominational group in order to accept orders to active duty, if offered. Key factors considered in ordering a chaplain to active duty are age, experience, physical and professional qualifications, Navy personnel manning levels, and the need to maintain denominational balance in the Chaplain Corps.

## EMPLOYMENT OPPORTUNITY

Approximately 850 men and women naval officers are currently employed in the Chaplain Corps. All chaplains must initially enter the Navy through Naval Reserve commissions. However, opportunity exists for transfer into the Regular Navy. For example, approximately 500 of the 850 chaplains maintain status in the Regular Navy. For those officers who remain in the Naval Reserve, both active and inactive duty options exist. Inactive duty options may include some periods of temporary active duty, annual 2-week active duty training periods, and periodic drills.

There is also a Theological Student Program. Qualified students who are attending accredited theological seminaries may be commissioned in the grade of ensign in the Naval Reserve prior to graduation. After graduation and ordination they are obligated to serve 3 years on active duty. They may elect to fulfill that commitment immediately after graduation or at some later time in their careers.

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## CIVIL ENGINEER CORPS OFFICER*

### NATURE OF THE JOB

Civil Engineer Corps (CEC) Officers are professional civil engineers and architects. They plan and direct the construction and maintenance of a wide range of Navy facilities, including housing for personnel, schools, hospitals, airports, docks, canals, radio stations and railroads. They are responsible for the installation and maintenance of "public works" such as telephone systems, water works, and electrical lines. They are responsible for undersea construction projects and are developing a seafloor engineering capability.

CEC Officers may work as construction contract managers for new shore facilities and for additions or improvements to existing facilities. That kind of assignment requires CEC Officers to work directly with civilian construction contractors. The CEC Officers direct advertisement of the work to be done, evaluate bids, award contracts, and supervise construction projects to make sure the work is done well, in accordance with plans, and on time.

CEC Officers may head Navy Public Works Departments or may be staff members of Public Works Departments. In those assignments the CEC Officers report to the Commanding Officer of the station. At major stations, the work is similar to that of a city manager of a small city. The Public Works Department is responsible for maintenance of buildings and grounds, the water and sewage systems and other utilities.

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A relatively new area of responsibility is shore-based nuclear power. The Civil Engineering Corps is responsible for safety and safety compliance at the Navy's nuclear power facilities. The Corps operates the nuclear plant at McMurdo Station in the Antarctic and is developing portable nuclear power plants.

A number of CEC Officers work in the field of urban or regional planning. They develop master plans for the Navy's shore facilities. That task involves land-use planning, deciding on the locations of facilities and studying community development around Navy stations. Planning tasks also require CEC Officers to analyze the Navy's changing needs. They must take into account force size and characterisics, the nature of operations, types and amounts of equipment, movement patterns or logistics, etc., so that they can plan facilities to meet current and future requirements.

Pollution control is another kind of work done by CEC Officers. They develop oil-spill removal systems for harbors, and they plan and build plants for treatment of industrial waste, sewage, and waste from power-generating plants.

Finally, the Navy's Seabees are led by CEC Officers. The Seabees are mobile construction teams. They travel all over the world, to any location where the Navy needs new construction or construction repairs. The Seabees are well known for their work during combat in World War II, and in later conflicts. They have built overseas bases, bridges, docks and dams; have dug wells and have created other facilities needed by the fighting forces—often working under fire.

In recent years the Seabees have served as technical assistance teams. Teams of as few as 12 Seabees and one CEC Officer help developing nations with civilian construction projects. They build bridges, schools, roads, drainage systems, sanitary facilities—teaching workers in the host countries in the process.

## WORKING CONDITIONS

CEC Officers may be assigned to work throughout the United States and overseas. There are many assignments to remote locations, where weather may be severe and living conditions plain or rugged. There is frequent field work in this job and at times it may be strenuous. CEC Officers should be in good health and enjoy working outside as well as in office settings. Officers who head Seabee teams may encounter particularly rugged working conditions.

### Sea-Shore Rotation

For Civil Engineer Corps Officers the term "sea duty" applies to the time they spend with mobile construction battalion units. Only about 15% of all CEC Officers serve with mobile construction battalions at any one time.

The remaining 85% serve in public works, construction or staff billets at facilities in the United States and overseas. Tours of duty average 2 to 3 years in length.

## QUALIFICATIONS

Applicants for a commission in the Civil Engineer Corps must be U.S. citizens between the ages of 19 and $27\frac{1}{2}$. They must have a degree in civil, electrical, mechanical, industrial, architectural, construction, nuclear or chemical engineering, or in architecture. The degree curriculum must be accredited by the Engineers' Council for Professional Development or by the National Architectural Accrediting Board, Inc. Applicants with degrees in other engineering disciplines will be considered on an individual basis. It is very helpful if applicants have obtained the Engineer-in-Training (EIT) certificate during their senior year in college.

Candidates selected for the Civil Engineer Corps must successfully complete training in naval subjects at the Naval Officer Candidate School, Newport, Rhode Island. Graduates of that 19-week, intensive training program are commissioned as Ensigns in the Civil Engineer Corps, U.S. Naval Reserve. They are obligated to serve on active duty for 3 years from the time of commissioning. Then they may go on reserve status for 6 years or elect to stay in the regular Navy as active duty officers. (Reserve officers participate in periodic weekend drills, 2-week summer camps, and special training programs. They are paid for those assignments and earn credits toward retirement pensions.)

## EMPLOYMENT OPPORTUNITY

There are currently about 1,400 active duty men and women CEC Officers. The number of openings each year may vary depending on the Navy's needs an on personnel turnover. In general, the employment outlook is good for well qualified applicants.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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# JUDGE ADVOCATE GENERAL'S CORPS OFFICER *

## NATURE OF THE JOB

Navy Lawyers are called Judge Advocates. They work as members of the Judge Advocate General's Corps. (The Judge Advocate General is the highest ranking legal officer in the Navy.)

Legal practices are generally the same, whether practiced in the Navy or in a civilian setting. Navy lawyers can encounter the full range of issues encountered by civilian lawyers. The major areas of legal specialty in the Navy are:

- Legal aid to Navy personnel and their dependents
- Military Law (courts marital trial counsel and defense counsel)
- Legislative liaison (developing and presenting the Navy's position on matters before the U.S. Congress; may include drafting of legislation)
- International Law (law regulating the relationships between nations; duties might include drafting and interpretation of treaties, and contributing to negotiations with representatives of other nations on issues related to Navy facilities and personnel overseas)

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* Each Judge Advocate General's Corps Officer is involved in some of the general work of the Navy as well as the work of his or her own specialty or occupation. It is very important for each officer to understand the general work of the Navy as well as the work of his or her own specialty. The first chapter of this manual describes the general work of the Navy.

- Admiralty Law (law relating to commerce and navigation on the high seas and on other navigable waters)
- Administrative Law (regulations and statutes that pertain to Navy activities and naval personnel; duties include advising on existing regulations and law, reviewing proposed legislation for consistency with existing regulations and laws, and deciding on conflict of interest questions that may come up when retired Navy personnel consider employment with private organizations)
- Tax Law
- Litigation and claims
- Major investigations.

Navy lawyers do specialize as they advance in their careers. However, work in the Navy frequently requires that lawyers engage in a broader range of practice than they might in civilian jobs. For example, trial work is a specialty in civilian law practice. Relatively few civilian lawyers do a significant amount of trial work. A lawyer entering the Navy can be just about certain of engaging in trial work in his first year of service. New members of the Judge Advocate General's Corps are called upon to act as prosecuting attorneys and as defense attorneys for Navy personnel before courts martial.

In fact, new Navy lawyers can expect to gain the most experience in military law and trial work -- that is, pre-trial investigations, and prosecution and defense in court martial trials and appeals. However, it is Navy policy to make sure that the duties of new lawyers give them experience in most or all of the specialty areas listed above.

## WORKING CONDITIONS

Navy lawyers most typically work at shore facilities. They may work in the United States or overseas. Major Navy law centers are located at large naval bases.

Navy lawyers may be assigned to sea duty as well, usually aboard aircraft carriers. Sea duty generally is voluntary.

Since Navy women do not serve aboard combatant ships, women in the Judge Advocate General's Corps rotate among shore facilities in the United States and overseas.

## Assignment Pattern

When lawyers enter the Judge Advocate General's Corps they are typically assigned to a major law center in the United States for 3 years. After that first tour of duty, Navy lawyers get to state their preferences for both the location of their next assignment and the type of assignment (that is, the legal specialty in which they will work). At the present time, assignment preferences usually can be honored. Overseas assignments are popular for the second tour of duty. Overseas tours last from 1-3 years.

## QUALIFICATIONS

The basic requirements for applicants are as follows:

- Citizenship -- Open only to citizens of the United States
- Age -- Nineteen years and not more than $32\frac{1}{2}$ at the time of appointment (adjustable up to 36 months for previous active duty)
- Education -- Be a member of the Bar of a Federal Court or the highest court of a state, territory, or the District of Columbia. While application may be filed prior to graduation from law school and admission to the bar, proof of graduation and admission are prerequisites for appointment
- Physical -- Be in good health and meet the standards established by the Navy Department. Waivers of defective visual acuity may be authorized provided both eyes correct to at least 20/40 and no organic disease exists.

There is a special student program. Prelaw students in their senior year of college may apply for a commission as ensign in the Naval Reserve. After graduating, they are placed on inactive duty status in the Reserve until they finish law school and pass the bar exam. Then they are commissioned as lieutenants-junior grade and placed on active duty status in the Judge Advocate General's Corps.

Appointment to the Judge Advocate General's Corps or to the student program is competitive. Applicants who meet the basic requirements are chosen by a Navy selection board based on their academic records and other background information.

## EMPLOYMENT OPPORTUNITY

There are currently 768 positions for men and women officers in the Judge Advocate General's Corps. Relatively few openings occur each year, so there is no good deal of competition. People who are interested in becoming Navy lawyers will need strong academic records. The number of opportunities in the future may change if the size of the naval force and other factors change.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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# MEDICAL CORPS, DENTAL CORPS, AND NURSE CORPS OFFICERS*

## NATURE OF THE JOB

The Medical, Dental and Nurse Corps are open only to candidates who have completed their graduate training in medicine, dentistry or professional nursing. Personnel in these Corps perform the same kinds of functions that doctors, dentists or registered nurses perform in the civilian sector. Both research and clinical opportunities exist in all three Corps.

Medical Corps Officers may specialize in approximately 30 common medical specialties in addition to the military specialties of aviation medicine, submarine medicine, and the Antarctic research program. A limited number of internship and residency training positions are available in practically every specialty.

Dental Corps Officers may work in general dentistry or in one of the dental specialties. A select number of applicants may be chosen for the general practice residency program in dentistry given in the large Navy teaching hospitals.

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* Each Medical Corps, Dental Corps, and Nurse Corps Officer is involved in some of the general work of the Navy as well as the work of his or her own specialty or occupation. It is very important for each officer to understand the general work of the Navy as well as the work of his or her own specialty. The first chapter of this manual describes the general work of the Navy.

Nurse Corps Officers may perform general nursing functions or specialize in such areas as orthopedic nursing, anesthesiology, operating room management, coronary care, intensive care, obstetrics, pediatrics, or hyperbaric nursing. Research, teaching and administrative positions also are available in the Nurse Corps.

## WORKING CONDITIONS

Medical Corps Officers work in hospitals, dispensaries and on staffs in the United States and overseas. At sea they are generally assigned to large ships such as carriers, cruisers and auxiliary ships. Although the size of the facilities on different ships may vary, the medical duties in all locations are similar.

Dental Corps Officers also may be assigned to shore or sea duty. Ashore, Dental Corps Officers work in hospitals, clinics and on various staffs in the United States and overseas. At sea, dental departments are established on large naval ships such as cruisers, carriers, and auxiliary ships.

Nurse Corps Officers usually work in naval hospitals in the United States and overseas.

### Assignment Pattern

Medical Corps Officers are more likely to serve at sea if they remain in the Navy after an initial two-year tour. A normal tour of shore duty in the United States lasts two years. A limited number of billets exist overseas. Lengths of tours for these billets range from 2 to $3\frac{1}{2}$ years. Officers who do go to sea usually are transferred from shipboard to shore duty after 12 to 15 months.

Dental Corps assignments tend to alternate between shore duty in the United States, sea duty aboard larger ships, and overseas shore duty.

Nurse Corps Officers are initially assigned to hospitals in the United States. After one year of duty, a request can be made for work in overseas hospitals. All appointments are made initially to the Naval Reserve. Active or inactive duty may be chosen. However, at the time of commissioning, the officer agrees to remain in the Naval Reserve for 6 years and may be called to active duty during a national emergency or declaration of war by Congress. A period of active duty is for a minimum of 2 years; the 4 remaining years may be served through inactive duty.

Preferences can be stated for all assignments and locations. Effort is made to assign personnel to billets of their choice, but the needs of the service outweigh other factors. However, Nurse Corps Officers usually are able to be assigned to their first, second, or, at the very least, their third choice.

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Since Navy women do not serve aboard combatant ships, women in the Medical, Dental and Nurse Corps rotate among shore facilities in the United States and overseas.

## QUALIFICATIONS

Applicants for the Medical and Dental Corps must have completed graduate work in an approved medical or dental school. Dental Corps candidates must have completed dental school within the 10 years prior to application.

Candidates for the Nurse Corps must be graduate registered professional nurses, who have completed a nursing education program of at least 3 academic years in length. They also must be licensed to practice as a professional nurse in at least one state or in the District of Columbia.

Student programs exist for all three Corps whereby financial assistance is given to students in return for a period of active service upon graduation (usually two years minimum). Nurse Corps candidates are limited to two years financial assistance. However, they can receive such assistance for attending either an accredited collegiate or hospital nursing program.

## EMPLOYMENT OPPORTUNITY

There are approximately 3,800 doctors in the Medical Corps, 1,700 dentists in the Dental Corps, and 2,500 nurses in the Nurse Corps. There are openings every year for fully trained men and women doctors, dentists and nurses. However, competition exists for those who want to receive specialty training. For example, applications for internships or residencies in the Medical Corps are double the number of openings. Likewise, the general practice residency program in the Dental Corps is available only to a select number of applicants. However, applications for openings are taken every year.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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## MEDICAL SERVICE CORPS OFFICER*

### NATURE OF THE JOB

Medical Service Corps Officers, while not Doctors of Medicine themselves, work closely with the Navy's physicians, dentists, nurses and enlisted medical staff. They may be involved with direct patient care, hospital administration, medical research, or a wide variety of medical specialties. The Medical Service Corps is separated into six sections:

- Medical Allied Sciences Section, which includes approximately 25 specialties ranging over the physical and psychological sciences. Some examples of specialist positions are bacteriologist, biochemist, entomologist, medical technologist, physicist, psychologist, radiobiologist, radiation health, serologist, and virologist
- Medical Specialists Section, which includes the specialties of dietitian, occupational therapist, and physical therapist
- Optometry Section
- Pharmacy Section

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* Each Medical Service Corps Officer is involved in some of the general work of the Navy as well as the work of his or her own specialty or occupation. It is very important for each officer to understand the general work of the Navy as well as the work of his or her own specialty. The first chapter of this manual describes the general work of the Navy.

- Podiatry Section
- Health Care Administration Section, which includes general hospital or medical department managers or administrators and more specialized hospital food service administrators.

Personnel in all of these specialties perform the same functions that their civilian counterparts would perform. Many of the above specialties require knowledge and training at the master's degree level. All Medical Service Corps programs are open to both men and women except the Radiation Health program (under the Medical Allied Sciences Section) which is open only to men.

## WORKING CONDITIONS

Medical Service Corps Officers may work in medical centers and naval hospitals in the United States and overseas. Major research activities are carried on both in the United States and overseas (primarily in California, Maryland, Illinois, Taiwan, and Egypt). Preventive medicine units, to which some Medical Service Corps Officers may be assigned, are located in California, Virginia, Hawaii, and Italy. There are also some shipboard assignments, usually to larger ships like carriers.

### Assignment Pattern

All officers appointed directly from civilian life are initially appointed in the Naval Reserve and may request appointment in the Regular Navy after a prescribed period of active duty. Appointments are initially made in grades of ensign through lieutenant, depending upon the individual applicant's education and experience at time of appointment. Assignments are made on the basis of personal preference, career development considerations, and the needs of the Navy.

Active duty tours are usually 2-3 years in length. While most billets are shore billets in the U.S. and overseas, Medical Service Corps Officers can expect one or two sea duty tours during a 20 year career.

"Sea duty" includes all of the time during which an officer is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home. "Shore duty" is duty at permanent shore locations, where Medical Service Corps Officers provide support for fleet units or for the Navy in general.

Since Navy women do not serve aboard combatant ships, women in the Medical Service Corps rotate among shore facilities in the United States and overseas.

## QUALIFICATIONS

A candidate must be between 18 and 32 years of age to be appointed in the grade of ensign. Minimum age requirements for the grades of lieutenant-junior grade or lieutenant are 33 and 39 years, respectively. Extensions may be made for prior active service (not to exceed 36 months).

Minimum education requirements are as follows:

- Medical Allied Science Section -- completion of all requirements for a Master's Degree from an accredited college or university in or related to the specialty applied for; exceptions are made for the specialties of aerospace physiology, radiation health, and medical technology, which require only a baccalaureate degree in physics, chemistry or one of the biological sciences
- Medical Specialists Section -- a baccalaureate degree from an accredited college or university in the specialty applied for, plus certification by the American Medical Association for the specialties of Occupational Therapy and Physical Therapy
- Optometry Section -- a Doctor of Optometry degree from an accredited college or university
- Pharmacy Section -- a baccalaureate degree from an accredited college or university with a major in pharmacy, plus evidence of registration as a pharmacist in one of the states or the District of Columbia
- Podiatry Section -- a graduate of a college of podiatry accredited by the American Podiatry Association
- Health Care Administration Section -- a baccalaureate degree with a major in sanitary science, environmental health, or hospital/health care administration; a Master's degree in hospital/health care administration is desirable.

Special student programs are available in the Medical Specialists Section, the Optometry Section, and the Health Care Administration Section which allow for completion of educational requirements under Navy sponsorship in return for a 2 or 3 year obligation.

## EMPLOYMENT OPPORTUNITY

There are approximately 1,700 positions for men and women officers in the Medical Service Corps. The Health Care Administration Section is the largest of the six sections. Selection for entry into this Corps is very competitive, with few openings (probably less than 100) occurring each year.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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## SUPPLY CORPS OFFICER *

### NATURE OF THE JOB

The Supply Corps ensures that U.S. Navy forces at sea and ashore throughout the world have the materials and equipment they need to carry out their missions. The Supply Corps is responsible for budgeting and cost control, purchasing, inventory management and the distribution of very large quantities of goods. The Corps is responsible for all supplies used by the Navy except weaponry.

The work of the Supply Corps requires a broad range of professional skills. Supply Corps Officers specialize in one or more of the following fields:

- Financial management
- Inventory management
- Food service management
- Merchandising
- Transportation management
- Petroleum management
- Operations research

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* Each Supply Corps Officer is involved in some of the general work of the Navy as well as the work of his or her own specialty or occupation. It is very important for each officer to understand the general work of the Navy as well as the work of his or her own specialty. The first chapter of this manual describes the general work of the Navy.

- Computer science
- Purchasing
- Contract management.

The officers supervise enlisted personnel who work in supply functions and schedule and coordinate supply activities with officers of fleet and shore operating units. They often are assigned military duties in addition to their supply duties.

## WORKING CONDITIONS

Supply Corps Officers are assigned to sea duty aboard Navy ships of all sizes and to shore duty at Navy facilities in the United States and overseas. Depending upon their particular job, varying amounts of their time will be spent in an office or in the field where they supervise and manage the personnel and facilities assigned to them. These can range from warehouses, shipping terminals or fuel farms to computer rooms and offices, and may involve large numbers of personnel and large amounts of money.

### Sea-Shore Rotation

The typical Supply Corps career begins, after training, with a 30 month initial tour of sea duty. Following tours rotate between locations in the United States, overseas and afloat. Assignment patterns vary depending upon officers' personal desires, their professional specialities and performance, and the needs of the Navy.

"Sea duty" includes all of the time during which an officer is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home. "Shore duty" is duty at permanent shore locations, where Supply Corps Officers provide support for fleet units or for the Navy in general.

Since Navy women do not serve aboard combatant ships, women in the Supply Corps rotate among shore facilities in the United States and overseas.

## QUALIFICATIONS

Persons interested in officer positions in the Supply Corps must have a bachelor's degree from an accredited college or university. Naval Academy and NROTC graduates, selected for entry into the Supply Corps, are commissioned after graduation and then enter the Navy Supply Corps School for 6 months of intensive training in their field. Other graduates must attend the Navy Office Candidate School for 4 months of general Navy officer training. After successful completion of Officer Candidate School, graduates are commissioned and those selected for the Supply Corps report to the Supply Corps School for training.

## EMPLOYMENT OPPORTUNITY

There are approximately 4,400 men and women officers presently serving in the Supply Corps. Currently the Supply Corps accepts about 100 NROTC and 160 Officer Candidate School graduates each year. Future requirements will vary depending on the needs of the Navy, but opportunities should be very good for qualified applicants.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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# ADMINISTRATIVE LIMITED DUTY OFFICER *

## NATURE OF THE JOB

Administrative Limited Duty Officers (LDOs) are technical managers in the field of naval administration. They have responsibilities for aspects of personnel administration, office organization and procedures, legal work, budget and fiscal control, space planning, work-progress reporting, and information dissemination.

Administration LDOs supervise the activities of enlisted personnel who work in clerical, administrative, and publications job categories or "ratings." It will be helpful to read about the following enlisted ratings to understand the variety of things an Administrative LDO may do as a manager:

| Enlisted Ratings That Involve Administration Work | Pages in This Manual Where Information Can Be Found |
|---|---|
| Legalman | 215 |
| Personnelman | 274 |
| Postal Clerk | 279 |
| Yeoman | 331 |
| Journalist | 210 |
| Lithographer | 220 |

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* Each Administrative Limited Duty Officer is involved in some of the general work of the Navy as well as the work of his own specialty or occupation. It is very important for each officer to understand the general work of the Navy as well as the work of his own specialty. The first chapter of this manual describes the general work of the Navy.

In general, Navy administration work includes:

- Operation of administrative offices at naval facilities; general administrative support to naval commands
- Recruiting, selection, assignment, promotion, transfer, sea-shore rotation, reenlistment, and separation matters
- Development and administration of personnel benefits programs (e.g., medical, housing, moving allowances, leave)
- Development and administration of education, training, and career development programs
- Development and administration of recreation programs
- Job analysis, classification, and rating; development of job descriptions and qualifications; preparation of manpower reports and policies
- Administration of legal matters and naval discipline
- Operation of Navy postal services
- Public relations activities and liaison with other military services
- Preparation, publication, and distribution of training materials, handbooks, manuals, reports, newspapers, personnel notices, correspondence and other written materials.

The work of Administrative LDOs varies, depending on rank and on the specific jobs to which they are assigned. They may work, for example, as Administrative Assistants or Administrative Officers, as Postal Officers, or as Personnel Officers. Other assignments include Aide, Flag Secretary, and Staff Secretary.

## WORKING CONDITIONS

Administrative LDOs share the conditions of the personnel they supervise. Usually, they work in office settings. They may be assigned to duty aboard ships or at shore facilities in the United States and overseas.

## Sea-Shore Rotation

Like other Limited Duty Officers, Administrative LDOs spend about 2-3 years on "sea duty" when they become LDOs. After that, they spend 2-3 years on "shore duty," then 1-3 years at an overseas Navy facility or 2-3 years at sea, followed again by 2-3 years ashore, and so on until retirement.

"Sea duty" includes all of the time during which an officer is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home. "Shore duty" is duty at permanent shore locations, where Administrative LDOs provide support for fleet units or the Navy in general.

## QUALIFICATIONS

To be eligible for the position of Administrative Limited Duty Officer, personnel must first gain experience in one of the enlisted ratings in the administration field. Some enlisted personnel become Warrant Officers in the Ship's Clerk category before becoming Administrative LDOs. (Warrant Officers are generally technical specialists who have fewer management responsibilities than LDOs.) Other persons advance directly from enlisted to LDO status.

All Limited Duty Officers must acquire the general skills and knowledge appropriate for managers. They must understand the organization of the Navy, the relationships among its various units, and its role in relation to the other agencies in the Department of Defense. They must know naval history, customs and etiquette, Navy regulations, and personnel functions, rights and benefits. They must know the duties, authority, and responsibilities of officers in various categories. They must know how to plan and conduct training, and they must have the leadership skills necessary to guide personnel, develop individual responsibility, and maintain morale.

To become Administrative LDOs, personnel must also have the technical knowledge and skills necessary to direct work in that field. The position of LDO is competitive. Personnel become LDOs by showing on the job and on qualification tests that they have superior technical and managerial capabilities.

## EMPLOYMENT OPPORTUNITY

There are presently about 275 Navy Limited Duty Officers in the administrative specialty. The number of opportunities for enlisted personnel to advance to that position fluctuates, depending on the needs of the Navy. Competition may be keen because of the number of personnel working in the ratings related to administration.

Existing legislation does not authorize appointment of Navy women to Limited Duty Officer status.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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# AVIATION DECK LIMITED DUTY OFFICER*

## NATURE OF THE JOB

The position of Aviation Deck Limited Duty Officer (LDO) is new. The Bureau of Naval Personnel has not yet published an official description of the work. However, from the information that is available, it may be said that Aviation Deck LDOs are technical managers of aircraft handling operations aboard aircraft carriers and at shore stations serving aircraft carriers.

Aviation Deck LDOs supervise the activities of enlisted personnel who work as Aviation Boatswain's Mates. It will be helpful to read about that job category, or "rating," to understand the variety of things the LDOs may do as managers. The enlisted rating of Aviation Boatswain's Mate is described on pp. 72-75 of this manual.

In general, aviation deck work includes:

- Maintenance and operation of aircraft launching and recovery equipment (Aircraft are actually thrust into takeoff, or "launched" from aircraft carriers by catapults, since there is not enough room for the usual takeoff. Aircraft are "recovered," or controlled in landing, by means of wires on the flight deck that are snagged with a hook attached to the aircraft.)

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* Each Aviation Deck Limited Duty Officer is involved in some of the general work of the Navy as well as the work of his own specialty or occupation. It is very important for each officer to understand the general work of the Navy as well as the work of his own specialty. The first chapter of this manual describes the general work of the Navy.

- Movement and securing of aircraft on deck and in hangar bays; maintenance and operation of equipment used to move aircraft on the carriers and ashore
- Aircraft fueling and lubrication aboard carriers and ashore; operation and maintenance of equipment and systems used in fueling and lubricating operations
- Crash, rescue, firefighting, crash removal, and damage control.

Aviation Deck LDOs direct and provide technical assistance to enlisted personnel in the foregoing areas of work. Aviation Deck LDOs also plan and conduct training for aviation deck personnel, develop safety procedures and ensure that they are followed, and perform administrative duties related to aviation deck work.

## WORKING CONDITIONS

Aviation Deck LDOs share the conditions of the personnel they supervise. They are assigned to aircraft carriers and to naval air stations in the United States and overseas. They may also be assigned to training centers.

The work is physically demanding and may be done outside in all kinds of weather. Hazardous conditions are common, including high noise levels, jet suction, jet exhaust, and moving aircraft.

### Sea-Shore Rotation

Like other Limited Duty Officers, Aviation Deck LDOs spend about 2-3 years on "sea duty" when they become LDOs. After that, they spend 2-3 years on "shore duty," then 1-3 years at an overseas Navy facility or 2-3 years at sea, followed again by 2-3 years ashore, and so on until retirement.

"Sea duty" includes all of the time during which an officer is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home. "Shore duty" is duty at permanent shore locations, where Aviation Deck LDOs provide support for fleet units or for the Navy in general.

## QUALIFICATIONS

To be eligible for the position of Aviation Deck Limited Duty Officer, personnel must first gain experience as enlisted workers in the Aviation Boatswain's Mate rating. Some enlisted personnel become Aviation Boatswains with the status of Warrant Officer before becoming LDOs. (Warrant Officers are generally technical specialists who have fewer management responsibilities than LDOs.) Other persons advance directly from enlisted to LDO status.

All Limited Duty Officers must acquire the general skills and knowledge appropriate for managers. They must understand the organization of the Navy, the relationships among its various units, and its role in relation to the other agencies in the Department of Defense. They must know naval history, customs and etiquette, Navy regulations, and personnel functions, rights and benefits. They must know the duties, authority, and responsibilities of officers in various categories. They must know how to plan and conduct training, and they must have the leadership skills necessary to guide personnel, develop individual responsibility, and maintain morale.

To become Aviation Deck Limited Duty Officers, personnel must also have the technical knowledge and skills necessary to direct work in that field. The position of LDO is competitive. Personnel become LDOs by showing on the job and on qualification tests that they have superior technical and managerial capabilities.

## EMPLOYMENT OPPORTUNITY

There are presently about 20 Navy Limited Duty Officers in the aviation deck specialty. The number of opportunities for enlisted personnel to advance to that position fluctuates, depending on the needs of the Navy. The work is demanding and personnel shortages exist. Thus it appears that there will be good opportunity for interested, competent personnel to advance.

Existing legislation does not authorize appointment of Navy women to Limited Duty Officer status.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

The Sailor's Rank and Occupation — Page 4
The General Work of the Navy — Page 23
Shipboard Routine in the Navy — Page 27
Shipboard Life — Page 28
Lengths of Cruises and Time Between Cruises — Page 30
"Shore Duty"—Work at Navy Shore Facilities — Page 32
Rotation Between "Sea Duty" and "Shore Duty" — Page 33

How the Navy Hires Page 35
Navy Pay Page 40
Navy Retirement Benefits Page 43
Navy Training and Education Page 44
Advancement in the Navy Page 51

# AVIATION MAINTENANCE LIMITED DUTY OFFICER *

## NATURE OF THE JOB

The position of Aviation Maintenance Limited Duty Officer (LDO) is new. The Bureau of Naval Personnel has not yet published an official description of the work. Based on the information that is available, it may be said that Aviation Maintenance LDOs are technical managers who have responsibilities for the operating efficiency and safety of aircraft engines and body surfaces, aircraft movable parts, and aircraft utility systems (for example, heating and air conditioning, pressurization, lighting, oxygen, fire extinguishing). Aviation Maintenance LDOs also have responsibilities for the various kinds of life-saving equipment carried in aircraft, such as parachutes and oxygen-breathing apparatus, life rafts, life jackets, protective clothing, and air-sea rescue equipment. Another area of responsibility in the aviation maintenance line is ground support equipment—that is, the support equipment used in handling, servicing, and maintaining aircraft and aircraft systems.

Aviation Maintenance LDOs direct and provide technical assistance to enlisted personnel who perform aviation maintenance work. It will be helpful to read about the following enlisted job categories, or "ratings," to understand the variety of things an Aviation Maintenance LDO may do as a manager:

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* Each Aviation Maintenance Limited Duty Officer is involved in some of the general work of the Navy as well as the work of his own specialty or occupation. It is very important for each officer to understand the general work of the Navy as well as the work of his own specialty. The first chapter of this manual describes the general work of the Navy.

| Enlisted Ratings That Involve Aviation Maintenance | Pages in This Manual Where Information Can Be Found |
|---|---|
| Aircrew Survival Equipmentman | 62 |
| Aviation Machinist's Mate | 87 |
| Aviation Maintenance Administrationman | 91 |
| Aviation Structural Mechanic | 101 |
| Aviation Support Equipment Technician | 106 |

In addition to directing and assisting enlisted personnel, Aviation Maintenance LDOs do such things as plan and conduct training in equipment operation and in maintenance and repair techniques. They also perform various administrative duties related to aviation maintenance activities.

## WORKING CONDITIONS

Aviation Maintenance LDOs share the conditions of the personnel they supervise. They may work in repair shops, or hangar areas. They may be assigned to aircraft carrier divisions or to naval air stations ashore. Some of the work is done outside, in good weather or bad. Often there is a high level of noise in the vicinity. When Aviation Maintenance LDOs work on flight lines or on the flight deck of a carrier, they may encounter the hazards of jet engine suction, jet exhaust, spinning propellers, and moving aircraft.

### Sea-Shore Rotation

Like other Limited Duty Officers, Aviation Maintenance LDOs spend about 2-3 years on "sea duty" when they become LDOs. After that, they spend 2-3 years on "shore duty," then 1-3 years at an overseas Navy facility or 2-3 years at sea, followed again by 2-3 years ashore, and so on until retirement.

"Sea duty" includes all of the time during which an officer is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home. "Shore duty" is duty at permanent shore locations, where Aviation Maintenance LDOs provide support for fleet units or for the Navy in general.

## QUALIFICATIONS

To be eligible for the position of Aviation Maintenance Limited Duty Officer, personnel must first gain experience in one of the enlisted ratings that involve aviation maintenance work. Some enlisted personnel become Aviation Maintenance Technicians with Warrant Officer status before becoming LDOs. (Warrant Officers are generally technical specialists who have fewer management responsibilities than LDOs.) Other persons advance directly from enlisted to LDO status.

All Limited Duty Officers must acquire the general skills and knowledge appropriate for managers. They must understand the organization of the Navy, the relationships among its various units, and its role in relation to the other agencies in the Department of Defense. They must know naval history, customs and etiquette, Navy regulations, and personnel functions, rights and benefits. They must know the duties, authority, and responsibilities of officers in various categories. They must know how to plan and conduct training, and they must have the leadership skills necessary to guide personnel, develop individual responsibility, and maintain morale.

To become Aviation Maintenance Limited Duty Officers, personnel must also have the technical knowledge and skills necessary to direct work in that field. The position of LDO is competitive. Personnel become LDOs by showing on the job and on qualification tests that they have superior technical and managerial capabilities.

## EMPLOYMENT OPPORTUNITY

There are presently about 280 Navy Limited Duty Officers in the aviation maintenance specialty. The number of opportunities for enlisted personnel to advance to that position fluctuates, depending on the needs of the Navy. Since air defense continues to grow in importance, the aircraft maintenance field should continue to offer good opportunities for career development in the Navy.

Existing legislation does not authorize appointment of Navy women to Limited Duty Officer status.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

The Sailor's Rank and Occupation Page 4
The General Work of the Navy Page 23
Shipboard Routine in the Navy Page 27
Shipboard Life Page 28

Lengths of Cruises and Time Between Cruises Page 30
"Shore Duty"—Work at Navy Shore Facilities Page 32
Rotation Between "Sea Duty" and "Shore Duty" Page 33
How the Navy Hires Page 35
Navy Pay Page 40
Navy Retirement Benefits Page 43
Navy Training and Education Page 44
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# AVIATION OPERATIONS LIMITED DUTY OFFICER*

## NATURE OF THE JOB

Aviation Operations Limited Duty Officers (LDOs) are technical managers in the field of air traffic control. They have responsibilities for ensuring safe intervals during takeoffs and landings on aircraft carriers and at airfields ashore. They assign airspace, which means they assign the ranges of altitude at which different types of aircraft may fly on different routes and missions. They make sure that pilots have adequate flight information, and they do other work to help guarantee flight safety and efficiency.

Aviation Operations LDOs supervise the activities of enlisted personnel who do air traffic control work, including Air Controlmen and Aviation Antisubmarine Warfare (ASW) Operators. (The ASW personnel direct aircraft movement in operations to track and combat enemy submarines.) It will be helpful to read about the work done by those personnel to understand the variety of things an Aviation Operations LDO may do as a manager. The enlisted job category, or "rating," of Air Controlman is described on pp. 58-61 of this book. The Aviation ASW Operator rating is described on pp. 65-67.

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* Each Aviation Operations Limited Duty Officer is involved in some of the general work of the Navy as well as the work of his own specialty or occupation. It is very important for each officer to understand the general work of the Navy as well as the work of his own specialty. The first chapter of this manual describes the general work of the Navy.

In general, air control work involves:

- Flight planning and flight assistance
- Control tower operations (control of taxiing, takeoffs, and landings by visual means)
- Radar air traffic control and instrument flight direction
- Weather monitoring and weather reporting for flight purposes.

In addition to supervising and providing technical assistance to enlisted personnel engaged in the foregoing activities, Aviation Operations LDOs do such things as check the qualifications of air controlmen to make sure they maintain their proficiency, schedule and observe flight test runs and instruction flights, and review flight clearances to make sure they are based on correct information and are in accordance with regulations. Aviation Operations LDOs also prepare and review air operations manuals, instructions, and other publications of technical flight information. They establish orientation and training programs for air traffic control personnel and for others involved in flight safety. They analyze flight violation reports to determine the causes of problems; they inspect airfields to make sure they are free of dangerous obstructions and are properly lighted and marked; and they work with maintenance personnel to make sure air traffic control equipment stays in good condition. Aviation Operations LDOs develop and coordinate local programs to reduce disturbances caused by aircraft noise. They coordinate Navy air operations with the Federal Aviation Administration. They analyze needs for aircraft control equipment and procedures, and make recommendations for changes at existing facilities or for new facilities. They participate in research programs and conferences to improve air traffic control equipment and techniques.

The work of Aviation Operations LDOs varies, depending on rank and on the specific job to which they are assigned. They may work, for example, as Technical Instructors, Training Officers, Air Traffic Control Officers, Radar Controlled Approach Officers, Radar Watch Officers, Radar Air Traffic Control Center Officers, Carrier Air Traffic Control Center Officers (in radar centers aboard aircraft carriers), Airspace Requirements Officers for Flight Requirements, or Navy Regional Airspace Officers.

## WORKING CONDITIONS

Aviation Operations LDOs share the conditions of the personnel they supervise. They may work aboard aircraft carriers, at Navy airfields, or at training centers. They may work in control towers or radar control centers.

Air traffic control can be a very taxing job. It requires great concentration, accuracy, and constant attention to changing conditions.

### Sea-Shore Rotation

Like other Limited Duty Officers, Aviation Operations LDOs spend about 2-3 years on "sea duty" when they become LDOs. After that, they spend 2-3 years on "shore duty," then 1-3 years at an overseas Navy facility or 2-3 years at sea, followed again by 2-3 years ashore, and so on until retirement.

"Sea duty" includes all of the time during which an officer is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home. "Shore duty" is duty at permanent shore locations, where Aviation Operations LDOs provide support for fleet units or for the Navy in general.

## QUALIFICATIONS

To be eligible for the position of Aviation Operations Limited Duty Officer, personnel must first gain experience as enlisted workers in the Air Controlman rating or the Aviation Antisubmarine Warfare Operator rating. Some enlisted personnel become Warrant Officers in the aviation operations specialty before becoming LDOs. (Warrant Officers are generally technical specialists who have fewer management responsibilities than LDOs.) Other persons advance directly from enlisted to LDO status.

All Limited Duty Officers must acquire the general skills and knowledge appropriate for managers. They must understand the organization of the Navy, the relationships among its various units, and its role in relation to the other agencies in the Department of Defense. They must know naval history, customs and etiquette, Navy regulations, and personnel functions, rights and benefits. They must know the duties, authority, and responsibilities of officers in various categories. They must know standard procedures for administrative control and for operations. They must know how to plan and conduct training, and they must have the leadership skills necessary to guide personnel, develop individual responsibility, and maintain morale.

To become Aviation Operations LDOs, personnel must also have the technical knowledge and skills necessary to direct work in that field. The position of LDO is competitive. Personnel become LDOs by showing on the job and on qualification tests that they have superior technical and managerial capabilities.

## EMPLOYMENT OPPORTUNITY

There are presently about 40 Navy Limited Duty Officers in the aviation operations specialty. The number of opportunities for enlisted personnel to advance to that position fluctuates, depending on the Navy's needs. Since the importance of air defense continues to grow, there seems to be good opportunity for advancement. However, a high degree of technical competence and responsibility is required.

Existing legislation does not authorize appointment of Navy women to Limited Duty Officer status.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

The Sailor's Rank and Occupation Page 4
The General Work of the Navy Page 23
Shipboard Routine in the Navy Page 27
Shipboard Life Page 28
Lengths of Cruises and Time Between Cruises Page 30
"Shore Duty"—Work at Navy Shore Facilities Page 32
Rotation Between "Sea Duty" and "Shore Duty" Page 33
How the Navy Hires Page 35
Navy Pay Page 40
Navy Retirement Benefits Page 43
Navy Training and Education Page 44
Advancement in the Navy Page 51

# AVIATION ORDNANCE LIMITED DUTY OFFICER*

## NATURE OF THE JOB

Aviation Ordnance Limited Duty Officers (LDOs) are technical managers in the field of airborne weapons and weapon systems. ("Ordnance" is a general term that refers to materials used for combat. It includes weapons and associated equipment such as gun sights and mounts, ammunition, rocket and missile launchers, etc.) Aviation Ordnance LDOs have responsibilities for the operation, maintenance, and safety of aircraft weapons and associated materials and equipment.

Aviation Ordnance LDOs supervise enlisted personnel who service and operate airborne weapons and weapon systems. Those personnel include Aviation Ordnancemen. It will be helpful to read about their work, to understand the variety of things an Aviation Ordnance LDO may do as a manager. The job category or "rating" of Aviation Ordnanceman is described on pp. 94-97 of this book.

In general, aviation ordnance work involves:

- Ordnance procurement
- Operation of aviation ordnance armories (storage areas) on ships or at air stations ashore

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* Each Aviation Ordnance Limited Duty Officer is involved in some of the general work of the Navy as well as the work of his own specialty or occupation. It is very important for each officer to understand the general work of the Navy as well as the work of his own specialty. The first chapter of this manual describes the general work of the Navy.

- Maintenance, calibration, alignment, inspection, testing and performance evaluation of weapons, weapon systems, and related equipment; maintenance of ammunition and pyrotechnics (flares and other fireworks)
- Maintenance of small arms carried aboard aircraft; instruction of pilots, aircrewmen and watchstanders in the use of small arms.

In addition to supervising ordnance personnel and providing technical assistance in the foregoing areas of work, Aviation Ordnance LDOs plan and conduct training for ordnance personnel. They plan and direct ordnance safety programs as well. They make sure that maintenance records are kept up to date and provide technical information about aviation ordnance. Aviation Ordnance LDOs with the rank of lieutenant commander or commander supervise the installation of aircraft weapons and weapon systems at Navy aviation facilities or at contractors' plants (the plants of manufacturers who build aircraft for the Navy). They also participate in planning and directing research to improve weapon and equipment design and testing procedures. They plan and supervise spending for aviation ordnance and perform other management duties that require higher levels of responsibility and technical or managerial skill.

The work of Aviation Ordnance LDOs varies depending on rank and on specific jobs to which they are assigned. They may work, for example, as Aircraft Maintenance Officers for weapons, as Special Weapons Assembly Officers, as Training Officers, as Weapons Procurement Officers, as Armament Research Officers, or Aircraft Armament Design Officers.

## WORKING CONDITIONS

Aviation Ordnance LDOs share the conditions of the personnel they supervise. They may be assigned to shore-based or carrier-based air squadrons or to aviation support facilities. They may work overseas as well as in the United States.

### Sea-Shore Rotation

Like other Limited Duty Officers, Aviation Ordnance LDOs spend about 2-3 years on "sea duty" when they become LDOs. After that, they spend 2-3 years on "shore duty," then 1-3 years at an overseas Navy facility or 2-3 years at sea, followed again by 2-3 years ashore, and so on until retirement.

"Sea duty" includes all of the time during which an officer is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home. "Shore duty" is duty at permanent shore locations, where Aviation Ordnance LDOs provide support for fleet units or for the Navy in general.

## QUALIFICATIONS

To be eligible for the position of Aviation Ordnance Limited Duty Officer, personnel must first gain experience as enlisted workers in the Aviation Ordnanceman rating. Some enlisted personnel become Warrant Officers in the aviation ordnance specialty before becoming LDOs. (Warrant Officers are generally technical specialists who have fewer management responsibilities than LDOs.) Other persons advance directly from enlisted to LDO status.

All Limited Duty Officers must acquire the general skills and knowledge appropriate for managers. They must understand the organization of the Navy, the relationships among its various units, and its role in relation to the other agencies in the Department of Defense. They must know naval history, customs and etiquette, Navy regulations, and personnel functions, rights and benefits. They must know the duties, authority, and responsibilities of officers in various categories. They must know how to plan and conduct training, and they must have the leadership skills necessary to guide personnel, develop individual responsibility, and maintain morale.

To become Aviation Ordnance Limited Duty Officers, personnel must also have the technical knowledge and skills necessary to direct work in that field. The position of LDO is competitive. Personnel become LDOs by showing on the job and on qualification tests that they have superior technical and managerial capabilities.

## EMPLOYMENT OPPORTUNITY

There are presently about 100 Navy Limited Duty Officers in the aviation ordnance specialty. The number of opportunities for enlisted personnel to advance to that position fluctuates, depending on the needs of the Navy. Since the importance of air defense continues to grow, there seems to be good opportunity for advancement. However, a high degree of technical competency and responsibility is required.

Existing legislation does not authorize appointment of Navy women to Limited Duty Officer status.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

The Sailor's Rank and Occupation Page 4
The General Work of the Navy Page 23
Shipboard Routine in the Navy Page 27
Shipboard Life Page 28
Lengths of Cruises and Time Between Cruises Page 30
"Shore Duty"—Work at Navy Shore Facilities Page 32
Rotation Between "Sea Duty" and "Shore Duty" Page 33
How the Navy Hires Page 35
Navy Pay Page 40
Navy Retirement Benefits Page 43
Navy Training and Education Page 44
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## AVIONICS LIMITED DUTY OFFICER *

### NATURE OF THE JOB

The position of Avionics Limited Duty Officer (LDO) is new. The Bureau of Naval Personnel has not yet published an official description of the work. Based on the information that is available, it may be said that Avionics LDOs are technical managers responsible for the installation, maintenance, and repair of advanced electronic equipment that is carried aboard aircraft. They assure the safe and efficient operation of equipment used for air navigation, communications, surveillance, and weapon control.

Avionics LDOs direct and provide technical assistance to enlisted personnel who work on aircraft electronic equipment. It will be helpful to read about the following enlisted job categories, or "ratings," to understand the variety of things an Avionics LDO may do as a manager:

| Enlisted Ratings That Involve Aviation Electronics | Pages in This Manual Where Information Can Be Found |
|---|---|
| Aviation Antisubmarine Warfare Technician | 68 |
| Aviation Electrician's Mate | 76 |

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* Each Avionics Limited Duty Officer is involved in some of the general work of the Navy as well as the work of his own specialty or occupation. It is very important for each officer to understand the general work of the Navy as well as the work of his own specialty. The first chapter of this manual describes the general work of the Navy.

| Enlisted Ratings That Involve Aviation Electronics | Pages in This Manual Where Information Can Be Found |
|---|---|
| Aviation Electronics Technician | 80 |
| Aviation Fire Control Technician | 84 |
| Tradevman | 325 |

In addition to directing and assisting enlisted personnel, Avionics LDOs do such things as plan and conduct training in the operation and upkeep of electronic equipment and systems, develop safety procedures and assure that they are followed, and perform administrative duties related to aviation electronics.

## WORKING CONDITIONS

Avionics LDOs share the conditions of the personnel they supervise. They may work in electronic shop settings, aboard aircraft, at electronics schools, or in administrative offices. They must be assigned to aircraft carrier divisions or to naval air stations ashore. Some of the work is performed outside, in good weather or bad. Often there is a high level of noise in the vicinity. When Avionics LDOs work on a flight line or on the flight deck of a carrier, they may encounter the hazards of jet engine suction, jet exhaust, spinning propellers, and moving aircraft.

### Sea-Shore Rotation

Like other Limited Duty Officers, Avionics LDOs spend about 2-3 years on "sea duty" when they become LDOs. After that, they spend 2-3 years on "shore duty," then 1-3 years at an overseas Navy facility or 2-3 years at sea, followed again by 2-3 years ashore, and so on until retirement.

"Sea duty" includes all of the time during which an officer is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home. "Shore duty" is duty at permanent shore locations, where Avionics LDOs provide support for fleet units or for the Navy in general.

## QUALIFICATIONS

To be eligible for the position of Avionics Limited Duty Officer, personnel must first gain experience in one of the enlisted ratings that involve work on aircraft electronic equipment. Some personnel become Warrant Officers in the aviation electronics specialty before becoming LDOs. (Warrant Officers are generally technical specialists who have fewer management responsibilities than LDOs.) Other persons advance directly from enlisted to LDO status.

All Limited Duty Officers must acquire the general skills and knowledge appropriate for managers. They must understand the organization of the Navy, the relationships among its various units, and its role in relation to the other agencies in the Department of Defense. They must know naval history, customs and etiquette, Navy regulations, and personnel functions, rights and benefits. They must know the duties, authority, and responsibilities of officers in various categories. They must know how to plan and conduct training, and they must have the leadership skills necessary to guide personnel, develop individual responsibility, and keep up morale.

To become Avionics LDOs, personnel must also have the technical knowledge and skills necessary to direct work in that field. The position of LDO is competitive. Personnel become LDOs by showing on the job and on qualification tests that they have superior technical and managerial capabilities.

## EMPLOYMENT OPPORTUNITY

There are presently about 200 Navy Limited Duty Officers in the aviation electronics specialty. The number of opportunities for enlisted personnel to advance to that position fluctuates, depending on the needs of the Navy. The importance of air defense continues to grow, and electronic equipment has become more and more important in air defense. Thus there seems to be good opportunity for advancement in the Navy aviation electronics field. However, competition in the field is keen; so only personnel who show a high degree of technical competency and responsibility are likely to advance to LDO.

Existing legislation does not authorize the appointment of Navy women to Limited Duty Officer status.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

The Sailor's Rank and Occupation Page 4

The General Work of the Navy Page 23

Shipboard Routine in the Navy Page 27

Shipboard Life Page 28

Lengths of Cruises and Time Between Cruises Page 30

"Shore Duty"—Work at Navy Shore Facilities Page 32

Rotation Between "Sea Duty" and "Shore Duty" Page 33
How the Navy Hires Page 35
Navy Pay Page 40
Navy Retirement Benefits Page 43
Navy Training and Education Page 44
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# BANDMASTER LIMITED DUTY OFFICER*

## NATURE OF THE JOB

Bandmaster Limited Duty Officers (LDOs) are administrators in the Navy Music Program. They supervise and provide technical assistance to Navy Musicians, who are enlisted personnel in the music program. It will be helpful to read about the work of Navy Musicians, to understand the variety of things a Bandmaster LDO may do as a music program administrator. (See pp. 252-256 in this book for a description of the enlisted job, or "rating," of Musician).

In general, work in the Navy's music program includes:

- Training and practice, individually and in concert bands, parade bands, dance bands, rock groups, and small chamber ensembles such as brass or woodwind trios, quartets, etc.
- Performing in concerts and parades, at social and ceremonial gatherings, on radio and television

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* Each Bandmaster Limited Duty Officer is involved in some of the general work of the Navy as well as the work of his own specialty or occupation. It is very important for each officer to understand the general work of the Navy as well as the work of his own specialty. The first chapter of this manual describes the general work of the Navy.

- Arranging music and adapting music for different instruments (such as arranging a medley of popular songs or adapting symphonic music for performance by a band)
- Maintaining music libraries
- Maintenance and repair of instruments
- Administrative and recordkeeping work related to operating the music program and to performances.

In addition to supervising the foregoing activities of personnel in the music program, Bandmaster LDOs teach music and conduct bands and other performing groups. They maintain contacts with civilian and government agencies that request engagements by music groups, select music for programs, and plan the programs. They also maintain professional contacts with the music industry, including music associations, publishers, manufacturers, educators, tradesmen and musicians. They make sure copyright laws are followed. They conduct auditions, performance examinations, and written examinations for musicians. They develop equipment, textbooks, and other materials as well as techniques for music instruction. They do research on music and provide technical information for procedures manuals, qualifications manuals and other publications concerning music personnel. They assist in planning personnel requirements for the music program and in assigning personnel to jobs. They keep track of program costs and estimate budget requirements. They direct the purchasing of music, instruments, and other materials needed for the music program.

The work of Bandmaster LDOs varies, depending on rank and on the specific jobs to which they are assigned. A Bandmaster LDO may work, for example, as a Music Director of a Navy band, as an administrative assistant for music matters at the Bureau of Naval Personnel or as Head of the Bureau's Music Branch. Other assignments include Instructor, Executive Officer, or School Administrator at the Navy School of Music. The Officer in Charge of the School of Music is a Bandmaster LDO with the rank of commander.

## WORKING CONDITIONS

Bandmaster LDOs share the conditions of the personnel they supervise. They may work at the Navy School of Music, at large shore stations, and at times aboard ships. They often travel locally and may go on performing tours. Tours of duty are usually about three years in length.

## QUALIFICATIONS

To be eligible for the position of Bandmaster Limited Duty Officer, personnel must first gain experience as enlisted Musicians. Some enlisted personnel become Bandmasters with Warrant Officer status before becoming LDOs. (Warrant Officers are generally technical specialists who have fewer management responsibilities than LDOs.) Other persons advance directly from enlisted to LDO status.

All Limited Duty Officers must acquire the general skills and knowledge appropriate for managers. They must understand the organization of the Navy, the relationships among its various units, and its role in relation to the other agencies in the Department of Defense. They must know naval history, customs and etiquette, Navy regulations, and personnel functions, rights and benefits. They must know the duties, authority, and responsibilities of officers in various categories. They must know standard procedures for administrative control and for operations. They must know how to plan and conduct training, and they must have the leadership skills necessary to guide personnel, develop individual responsibility, and maintain morale.

To become Bandmaster LDOs, personnel must also have the music knowledge and performing skills necessary to teach and direct musicians. The position of LDO is competitive. Personnel become LDOs by showing on the job and on qualification tests that they have superior technical and managerial capabilities.

## EMPLOYMENT OPPORTUNITY

There are presently about 10 Navy Limited Duty Officers in the music specialty. The number of opportunities for enlisted personnel to advance to that position depends mostly on turnover, with the overall requirement for Bandmasters remaining fairly stable.

Existing legislation does not authorize appointment of Navy women to Limited Duty Officer status.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

| | |
|---|---|
| The Sailor's Rank and Occupation | Page 4 |
| The General Work of the Navy | Page 23 |
| Shipboard Routine in the Navy | Page 27 |
| Shipboard Life | Page 28 |

Lengths of Cruises and Time Between Cruises Page 30
"Shore Duty"—Work at Navy Shore Facilities Page 32
Rotation Between "Sea Duty" and "Shore Duty" Page 33
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## CIVIL ENGINEER CORPS LIMITED DUTY OFFICER*

### NATURE OF THE JOB

Civil Engineer Corps Limited Duty Officers (LDOs), are technical managers in the field of civil engineering. They manage the planning and construction of roads, buildings, waterfront structures such as docks, airfields, and other kinds of construction for the Navy. They also have responsibilities for maintenance activities that involve construction and for public works projects such as the laying of water, electricity, and telephone lines.

Civil Engineer Corps LDOs supervise enlisted personnel who do construction and related work. It will be helpful to read about the following enlisted job categories, or "ratings," to understand the variety of things a Civil Engineer Corps LDO may do as a manager:

| Enlisted Ratings That Involve Construction and Related Work | Pages in This Manual Where Information Can Be Found |
|---|---|
| Builder | 119 |
| Construction Electrician | 126 |
| Construction Mechanic | 130 |
| Engineering Aid | 163 |

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* Each Civil Engineer Corps Limited Duty Officer is involved in some of the general work of the Navy as well as the work of his own specialty or occupation. It is very important for each officer to understand the general work of the Navy as well as the work of his own specialty. The first chapter of this manual describes the general work of the Navy.

| Enlisted Ratings That Involve Construction and Related Work | Pages in This Manual Where Information Can Be Found |
|---|---|
| Equipment Operator | 173 |
| Illustrator-Draftsman | 196 |
| Steelworker | 313 |
| Utilitiesman | 328 |

In general, civil engineering work in the Navy includes:

- Identifying needs and planning for construction and public works, including surveying and evaluation of soil conditions and the condition of existing structures
- New construction and public works
- Maintenance and repair
- Inspections.

In addition to supervising personnel engaged in the foregoing activities, Civil Engineer Corps LDOs plan, schedule, and conduct training related to construction and utilities work. They develop procedures for doing work and for maintaining equipment. They prepare budgets and establish cost control procedures. They also participate in planning for defense against enemy attacks and for mobilization of U. S. forces (that is, for getting forces into action).

The work of Civil Engineer Corps LDOs varies, depending on rank and on the specific jobs to which they are assigned. They may work, for example, as Housing Facilities Officers, Transportation Engineering Officers, Public Works Officers, officers in charge of the work of construction battalions, or as officers in charge of materials and equipment for construction battalions.

## WORKING CONDITIONS

Civil Engineer Corps LDOs share the conditions of the personnel they supervise. Their work may be strenuous. It is often done outdoors. Civil engineering personnel may work in mobile construction battalions, in which case they move from location to location where they are needed. They receive work assignments throughout the United States and overseas.

### Sea-Shore Rotation

For Civil Engineering Corps Limited Duty Officers the term "sea duty" applies to the time they spend with mobile construction battalion units. Only about 15% of all CEC Officers serve with mobile construction battalions at any one time. The remaining 85% serve in public works, construction or staff billets at facilities in the United States and overseas. Tours of duty average 2 to 3 years in length.

## QUALIFICATIONS

To be eligible for the position of Civil Engineer Corps Limited Duty Officer, personnel must first gain experience in one of the enlisted ratings related to civil engineering. Some enlisted personnel become Warrant Officers in the Civil Engineer Corps before becoming LDOs. (Warrant Officers are generally technical specialists who have fewer management responsibilities than LDOs.) Other persons advance directly from enlisted to LDO status.

All Limited Duty Officers must acquire the general skills and knowledge appropriate for managers. They must understand the organization of the Navy, the relationships among its various units, and its role in relation to the other agencies in the Department of Defense. They must know naval history, customs and etiquette, Navy regulations, and personnel functions, rights and benefits. They must know the duties, authority, and responsibilities of officers in various categories. They must know standard procedures for administrative control and for operations. They must know how to plan and conduct training, and they must have the leadership skills necessary to guide personnel, develop individual responsibility, and maintain morale.

To become Civil Engineer Corps LDOs, personnel must also have the technical knowledge and skills necessary to direct work in that field. The position of LDO is competitive. Personnel become LDOs by showing on the job and on qualification tests that they have superior technical and managerial capabilities.

## EMPLOYMENT OPPORTUNITY

There are presently 15 Navy Limited Duty Officers in the Civil Engineer Corps. The number of opportunities for enlisted personnel to advance to that position fluctuates, depending on the needs of the Navy.

Existing legislation does not authorize appointment of Navy women to Limited Duty Officer status.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

The Sailor's Rank and Occupation Page 4
The General Work of the Navy Page 23

Shipboard Routine in the Navy Page 27
Shipboard Life Page 28
Lengths of Cruises and Time Between Cruises Page 30
"Shore Duty"—Work at Navy Shore Facilities Page 32
Rotation Between "Sea Duty" and "Shore Duty" Page 33
How the Navy Hires Page 35
Navy Pay Page 40
Navy Retirement Benefits Page 43
Navy Training and Education Page 44
Advancement in the Navy Page 51

# CRYPTOLOGY LIMITED DUTY OFFICER*

## NATURE OF THE JOB

Cryptology Limited Duty Officers (LDOs) are technical managers in the field of communications. They work, in particular, with secret communications. ("Cryptology" means the study of "secret language.") They have responsibilities for research in the area of communications codes and for development, operation, and maintenance of electronic and other equipment used to transmit, store, code and decode secret information. They also have responsibilities for courier service. Couriers are special messengers who personally transport secret information and materials.

Cryptology LDOs supervise Communications Technicians, who are enlisted personnel who work in the cryptology field. It will be helpful to read about the work of those personnel, to understand the variety of things a Cryptology LDO may do as a manager. A limited description of the Communications Technician job category, or "rating," can be found on pp. 122-125 of this book.

Detailed information about the duties of Cryptology LDOs may not be made available to the general public because of the secret nature of the work. Their duties vary, depending on rank and on the specific jobs to which they are assigned. In general, they have duties in the areas of technical development, or equipment maintenance and repair, or they may direct some part of the actual operations of sending and receiving secret information, or they may be involved in the analysis of information. Cryptology LDOs may be assigned to the Naval Security Group, to the National Security Agency, or to a staff position in a major Navy operating command.

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* Each Cryptology Limited Duty Officer is involved in some of the general work of the Navy as well as the work of his own specialty or occupation. It is very important for each officer to understand the general work of the Navy as well as the work of his own specialty. The first chapter of this manual describes the general work of the Navy.

## WORKING CONDITIONS

Cryptology LDOs share the conditions of the personnel they supervise. They usually work in communications centers or in office settings aboard ships or at shore facilities. They may be assigned to duty overseas as well as in the United States.

### Sea-Shore Rotation

Like other Limited Duty Officers, Cryptology LDOs spend about 2-3 years on "sea duty" when they become LDOs. After that, they spend 2-3 years on "shore duty," then 1-3 years at an overseas Navy facility or 2-3 years at sea, followed again by 2-3 years ashore, and so on until retirement.

"Sea duty" includes all of the time during which an officer is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home. "Shore duty" is duty at permanent shore locations, where Cryptology LDOs provide support for fleet units or for the Navy in general.

## QUALIFICATIONS

To be eligible for the position of Cryptology Limited Duty Officer, personnel must first gain experience as enlisted Communications Technicians. Some enlisted personnel become Warrant Officers in the communications specialty before becoming Cryptology LDOs. (Warrant Officers are generally technical specialists who have fewer management responsibilities than LDOs.) Other persons advance directly from enlisted to LDO status.

All Limited Duty Officers must acquire the general skills and knowledge appropriate for managers. They must understand the organization of the Navy, the relationships among its various units, and its role in relation to the other agencies in the Department of Defense. They must know naval history, customs and etiquette, Navy regulations, and personnel functions, rights and benefits. They must know the duties, authority, and responsibilities of officers in various categories. They must know standard procedures for administrative control and for operations. They must know how to plan and conduct training, and they must have the leadership skills necessary to guide personnel, develop individual responsibility, and maintain morale.

To become Cryptology LDOs, personnel must also have the technical knowledge and skills necessary to direct work in that field. The position of LDO is competitive. Personnel become LDOs by showing on the job and on qualification tests that they have superior technical and managerial capabilities.

## EMPLOYMENT OPPORTUNITY

There are presently about 115 Navy Limited Duty Officers in the cryptology specialty. The number of opportunities for enlisted personnel to advance to that position fluctuates, depending on the needs of the Navy.

Existing legislation does not authorize appointment of Navy women to Limited Duty Officer status.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

| | |
|---|---|
| The Sailor's Rank and Occupation | Page 4 |
| The General Work of the Navy | Page 23 |
| Shipboard Routine in the Navy | Page 27 |
| Shipboard Life | Page 28 |
| Lengths of Cruises and Time Between Cruises | Page 30 |
| "Shore Duty"—Work at Navy Shore Facilities | Page 32 |
| Rotation Between "Sea Duty" and "Shore Duty" | Page 33 |
| How the Navy Hires | Page 35 |
| Navy Pay | Page 40 |
| Navy Retirement Benefits | Page 43 |
| Navy Training and Education | Page 44 |
| Advancement in the Navy | Page 51 |

## DATA PROCESSING LIMITED DUTY OFFICER *

### NATURE OF THE JOB

Data Processing Limited Duty Officers (LDOs) are technical managers in the field of automatic data processing (ADP). They work with both electric accounting equipment and electronic digital computers.

Data Processing LDOs supervise and provide technical assistance to enlisted personnel in ADP jobs. Those personnel include Data Processing Technicians and Data Systems Technicians. It will be helpful to read about their work, to understand the variety of things a Data Processing LDO may do as a manager. The enlisted job category, or "rating," of Data Processing Technician is described in this manual on pp. 134-137. The Data Systems Technician rating is described on pp. 138-141.

In general, ADP work in the Navy involves:

- Installation, calibration, maintenance, inspection, testing and repair of equipment and electronic computer systems

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* Each Data Processing Limited Duty Officer is involved in some of the general work on the Navy as well as the work of his own specialty or occupation. It is very important for each officer to understand the general work of the Navy as well as the work of his own category. The first chapter of this manual describes the general work of Navy.

- Wiring and operating electric accounting machines to perform various functions. (Wiring an electric accounting machine is the equivalent of programming an electronic computer)
- Programming, debugging and operating electronic digital computers and computer systems.

In addition to supervising and providing technical assistance to enlisted personnel doing the foregoing kinds of work, the Data Processing LDOs do such things as analyze needs for automated data processing equipment for different activities, advise in the selection of equipment, help to design appropriate operating systems, and select programming languages. They do complex programming jobs. They set priorities for processing jobs so that all users of the equipment can get their jobs done efficiently. They check processing jobs to maintain quality control. They develop processing evaluation methods, work standards and procedures manuals for programmers and analysts. They plan and conduct training for ADP personnel and for system users. They analyze costs and prepare budget estimates for ADP operations. They work with manufacturers on equipment design and on changes to update equipment in use. They participate in research projects to improve both equipment (hardware) and program capabilities (software).

The work of Data Processing LDOs varies, depending on rank and on the specific jobs to which they are assigned. They may work, for example, as ADP Production Officers, as Computer Systems Analysts, or as ADP System Directors.

## WORKING CONDITIONS

Data Processing LDOs share the conditions of the personnel they supervise. Usually they work at computer centers or in office settings aboard ships or at shore facilities. They may be assigned to duty overseas as well as in the United States.

### Sea-Shore Rotation

Like other Limited Duty Officers, Data Processing LDOs spend about 2-3 years on "sea duty" when they become LDOs. After that, they spend 2-3 years on "shore duty," then 1-3 years at an overseas Navy facility or 2-3 years at sea, followed again by 2-3 years ashore, and so on until retirement.

"Sea duty" includes all of the time during which an officer is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home. "Shore duty" is duty at permanent shore locations, where Data Processing LDOs provide support for fleet units or for the Navy in general.

## QUALIFICATIONS

To be eligible for the position of Data Processing Limited Duty Officer, personnel must first gain experience as enlisted workers in the Data Processing Technician rating or the Data Systems Technician rating. Some enlisted personnel become Warrant Officers in the data processing specialty before becoming LDOs. (Warrant Officers are generally technical specialists who have fewer management responsibilities than LDOs.) Other persons advance directly from enlisted to LDO status.

All Limited Duty Officers must acquire the general skills and knowledge appropriate for managers. They must understand the organization of the Navy, the relationships among its various units, and its role in relation to the other agencies in the Department of Defense. They must know naval history, customs and etiquette, Navy regulations, and personnel functions, rights and benefits. They must know the duties, authority, and responsibilities of officers in various categories. They must know standard procedures for administrative control and for operations. They must know how to plan and conduct training, and they must have the leadership skills necessary to guide personnel, develop individual responsibility, and keep up morale.

To become Data Processing LDOs, personnel must also have the technical knowledge and skills to direct the work done in their field. The position of LDO is competitive. Personnel become LDOs by showing on the job and on qualification tests that they have superior technical and managerial capabilities.

## EMPLOYMENT OPPORTUNITY

There are presently 30 Navy Limited Duty Officers in the the data processing specialty. The number of opportunities for enlisted personnel to advance to that position fluctuates, depending on the needs of the Navy. Since data processing is a growing field, the opportunities may be expected to increase. Competition for the LDO positions may be keen, however, because of the number of personnel interested in the field and the high level of skills that many possess.

Existing legislation does not authorize appointment of Navy women to Limited Duty Officer status.

ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

The Sailor's Rank and Occupation Page 4
The General Work of the Navy Page 23
Shipboard Routine in the Navy Page 27
Shipboard Life Page 28
Lengths of Cruises and Time Between Cruises Page 30
"Shore Duty"—Work at Navy Shore Facilities Page 32
Rotation Between "Sea Duty" and "Shore Duty" Page 33
How the Navy Hires Page 35
Navy Pay Page 40
Navy Retirement Benefits Page 43
Navy Training and Education Page 44
Advancement in the Navy Page 51

# DECK LIMITED DUTY OFFICER *

## NATURE OF THE JOB

Deck Limited Duty Officers (LDOs) are technical managers in the field of seamanship and navigation. They supervise and provide technical assistance to enlisted personnel who work in that field. It will be helpful to read about the following enlisted job categories, or "ratings," to understand the variety of things a Deck LDO may do as a manager:

| Enlisted Ratings That Involve Deck Work | Pages in This Manual Where Information Can Be Found |
|---|---|
| Boatswain's Mate | 109 |
| Quartermaster | 291 |
| Signalman | 303 |

In general, there are four major areas of deck work:

- Maintenance and repair of the ship's hull (frame, or body) and of deck machinery and equipment including the ship's small boats and rafts, lifesaving gear, cranes and hoists for lifting cargo and equipment, and anchors and associated machinery

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* Each Deck Limited Duty Officer is involved in some of the general work of the Navy as well as the work of his own specialty or occupation. It is very important for each officer to understand the general work of the Navy as well as the work of his own specialty. The first chapter of this manual describes the general work of the Navy.

- Cargo handling
- Deck communications and watchkeeping by visual and electronic means
- Navigation.

Deck LDOs plan, schedule, and conduct training in the foregoing areas as well as supervise the work done. In addition, they assist Officers of the Deck in navigating ships at sea. In port areas, Deck LDOs may be responsible for traffic control, assignment of pilots and assignment of ships' berths. (Pilots are licensed experts in each major port area who go onboard ships to guide them safely into port. Berths are like parking places for ships in port.) Deck LDOs direct small boats operations both at sea and in port, and they may serve as captains of tugs in harbor areas.

The work of Deck LDOs varies, depending on rank and on the specific jobs to which they are assigned. When assigned to sea duty, for example, a Deck LDO may work as Officer in Charge of yard and harbor craft, as Officer of a boat group in amphibious operations (operations involving the delivery and support of land forces by naval transport), as an Antisubmarine Warfare Officer, or as Ship's Navigator. Other shipboard assignments include First Lieutenant, Signal Officer, and Cargo Officer. Ashore, Deck LDOs often work as instructors, as managers at naval shipyards or bases, or in various administrative assignments.

## WORKING CONDITIONS

Deck LDOs share the conditions of the personnel they supervise. The work is often strenuous. Many tasks must be done outdoors, regardless of temperature and other weather conditions. Deck work can be hazardous—for example, when it involves the movement of heavy cargo and equipment, or over-the-side repairs, or small boat operations. Deck LDOs may be assigned to duty on surface ships or at shore stations including Navy shipyards and training centers.

### Sea-Shore Rotation

Like other Limited Duty Officers, Deck LDOs spend about 2-3 years on "sea duty" when they become LDOs. After that, they spend 2-3 years on "shore duty," then 1-3 years at an overseas Navy facility or 2-3 years at sea, followed again by 2-3 years ashore, and so on until retirement.

"Sea duty" includes all of the time during which an officer is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home. "Shore duty" is duty at permanent shore locations, where Deck LDOs provide support for fleet units or for the Navy in general.

## QUALIFICATIONS

To be eligible for the position of Deck Limited Duty Officer, personnel must first gain experience as enlisted Boatswain's Mates, Quartermasters, or Signalmen. Some enlisted personnel become Warrant Officers in the boatswain specialty before becoming LDOs. (Warrant Officers are generally technical specialists who have fewer management responsibilities than LDOs.) Other persons advance directly from enlisted to LDO status.

All Limited Duty Officers must acquire the general skills and knowledge appropriate for managers. They must understand the organization of the Navy, the relationships among its various units, and its role in relation to the other agencies in the Department of Defense. They must know naval history, customs and etiquette, Navy regulations, and personnel functions, rights and benefits. They must know the duties, authority, and responsibilities of officers in various categories. They must know standard procedures for administrative control and for operations. They must know how to plan and conduct training, and they must have the leadership skills necessary to guide personnel, develop individual responsibility, and keep up morale.

To become Deck Limited Duty Officers, personnel must also have the technical knowledge and skills necessary to direct work in that field. The position of LDO is competitive. Personnel become LDOs by showing on the job and on qualification tests that they have superior technical and managerial capabilities.

## EMPLOYMENT OPPORTUNITY

There are presently about 140 Navy Limited Duty Officers in the deck and navigation specialty. The number of opportunities for enlisted personnel to advance to that position fluctuates, depending on the needs of the Navy.

Existing legislation does not authorize appointment of Navy women to Limited Duty Officer status.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

| | |
|---|---|
| The Sailor's Rank and Occupation | Page 4 |
| The General Work of the Navy | Page 23 |

Shipboard Routine in the Navy Page 27
Shipboard Life Page 28
Lengths of Cruises and Time Between Cruises Page 30
"Shore Duty"—Work at Navy Shore Facilities Page 32
Rotation Between "Sea Duty" and "Shore Duty" Page 33
How the Navy Hires Page 35
Navy Pay Page 40
Navy Retirement Benefits Page 43
Navy Training and Education Page 44
Advancement in the Navy Page 51

# ELECTRONICS LIMITED DUTY OFFICER*

## NATURE OF THE JOB

Electronics Limited Duty Officers (LDOs) are technical managers in the field of electronics. They have responsibilities for the maintenance and operation of electronic equipment and systems used in communications, in the detection and tracking of ships, in the identification of ships, in countermeasures to electronic surveillance and weapons of enemy ships, and in navigation.

Electronics LDOs supervise enlisted personnel who do electronics work. It will be helpful to read about the following enlisted job categories, or "ratings," to understand the variety of things an Electronics LDO may do as a manager:

| Enlisted Ratings That Involve Electronics Work | Pages in This Manual Where Information Can Be Found |
|---|---|
| Data Systems Technician | 138 |
| Electronic Warfare Technician | 155 |
| Electronics Technician | 160 |
| Fire Control Technician | 177 |
| Ocean Systems Technician | 260 |

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* Each Electronics Limited Duty Officer is involved in some of the general work of the Navy as well as the work of his own specialty or occupation. It is very important for each officer to understand the general work of the Navy as well as the work of his own category. The first chapter of this manual describes the general work of the Navy.

| Enlisted Ratings That Involve Electronics Work | Pages in This Manual Where Information Can Be Found |
|---|---|
| Operations Specialist | 263 |
| Sonar Technician | 308 |

The following are examples of the duties of Electronics LDOs. They direct the installation, maintenance, calibration and alignment, inspection, testing, and repair of electronic equipment and systems. They direct the operation of electronic equipment and systems. They make sure that records on equipment maintenance and operation are kept up to date. They supervise spending in accordance with the budgets for electronics facilities. They make sure supplies and spare parts are available. They approve work orders, and schedule and assign jobs in electronics maintenance shops. They conduct inspections of facilities and make sure that personnel are following security regulations. They plan, schedule, and conduct training for electronics personnel. They direct the dissemination of information about electronic equipment and systems to command and staff personnel. They write reports and provide technical advice about electronic systems and equipment to command personnel. They also direct the operation of naval shore radio stations.

The work of Electronics LDOs varies, depending on rank and on the specific jobs to which they are assigned. They may work, for example as Electronics Installation and Maintenance Planning Officers, as Electronic Materials Officers ashore or aboard ship, as Traffic Communications Officers or as general Communications Officers ashore or aboard ship. Other assignments include Guided Missile Test Officer, Fire Control Officer, Radio Station Officer, Electronics Inspection and Survey Officer, Assistant Electronics Research Administrator, and Assistant Director of Electronic Engineering Plans and Policies.

## WORKING CONDITIONS

Electronics LDOs share the conditions of the personnel they supervise. They may be assigned to all types of Navy ships. Ashore they are assigned to schools, to naval bases, and to naval air stations. They may work in the United States or overseas.

### Sea-Shore Rotation

Like other Limited Duty Officers, Electronics LDOs spend about 2-3 years on "sea duty" when they become LDOs. After that, they spend 2-3 years on "shore duty," then 1-3 years at an overseas Navy facility or 2-3 years at sea, followed again by 2-3 years ashore, and so on until retirement.

"Sea duty" includes all of the time during which an officer is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean

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time away from home but rather time during which there will be some periods away from home. "Shore duty" is duty at permanent shore locations, where Electronics LDOs provide support for fleet units or for the Navy in general.

## QUALIFICATIONS

To be eligible for the position of Electronics Limited Duty Officer, personnel must first gain experience in one of the enlisted ratings in the electronics field. Some enlisted personnel become Electronics Technicians with the status of Warrant Officer before becoming LDOs. (Warrant Officers are generally technical specialists who have fewer management responsibilities than LDOs.) Other persons advance directly from enlisted to LDO status.

All Limited Duty Officers must acquire the general skills and knowledge appropriate for managers. They must understand the organization of the Navy, the relationships among its various units, and its role in relation to the other agencies in the Department of Defense. They must know naval history, customs and etiquette, Navy regulations, and personnel functions, rights and benefits. They must know the duties, authority, and responsibilities of officers in various categories. They must know how to plan and conduct training, and they must have the leadership skills necessary to guide personnel, develop individual responsibility, and maintain morale.

To become Electronics Limited Duty Officers, personnel must also have the technical knowledge and skills necessary to direct work in that field. The position of LDO is competitive. Personnel become LDOs by showing on the job and on qualification tests that they have superior technical and managerial capabilities.

## EMPLOYMENT OPPORTUNITY

There are presently about 300 Navy Limited Duty Officers in the electronics specialty. The number of opportunities for enlisted personnel to advance to that position fluctuates, depending on the needs of the Navy. Entry into the electronics category is highly competitive, and so it is limited to outstanding sailors with extensive experience in the Navy.

Existing legislation does not authorize appointment of Navy women to Limited Duty Officer status.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

The Sailor's Rank and Occupation Page 4
The General Work of the Navy Page 23
Shipboard Routine in the Navy Page 27
Shipboard Life Page 28
Lengths of Cruises and Time Between Cruises Page 30
"Shore Duty"—Work at Navy Shore Facilities Page 32
Rotation Between "Sea Duty" and "Shore Duty" Page 33
How the Navy Hires Page 35
Navy Pay Page 40
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## ENGINEERING/REPAIR LIMITED DUTY OFFICER*

### NATURE OF THE JOB

Engineering/Repair Limited Duty Officers (LDOs) are technical managers in the field of marine engineering. They manage the installation, operation, maintenance, and repair, of steam- and diesel-powered main propulsion systems of ships. (The propulsion system is the equipment that produces power to drive a ship through the water.) They have similar management responsibilities for shipboard utilities such as water systems, refrigeration systems, and electrical wiring systems, and they supervise maintenance and repair of certain navigational instruments and equipment.

Engineering/Repair LDOs supervise enlisted personnel who work in engineering and repair jobs, or "ratings" aboard ship, at shipyards, and at other shore facilities. It will be helpful to read about the following enlisted ratings, to understand the variety of things an Engineering/Repair LDO may do as a manager:

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* Each Engineering/Repair Limited Duty Officer is involved in some of the general work of the Navy as well as the work of his own specialty or occupation. It is very important for each officer to understand the general work of the Navy as well as the work of his own specialty. The first chapter of this manual describes the general work of the Navy.

| Enlisted Ratings That Involve Engineering/Repair Work | Pages in This Manual Where Information Can Be Found |
|---|---|
| Boilermaker | 113 |
| Boiler Technician | 116 |
| Electrician's Mate | 150 |
| Engineman | 168 |
| Hull Maintenance Technician | 191 |
| Instrumentman | 200 |
| Interior Communications Electrician | 205 |
| Machinery Repairman | 225 |
| Machinist's Mate | 229 |
| Molder | 247 |
| Opticalman | 266 |
| Patternmaker | 270 |

In general, Engineering/Repair LDOs do such things as supervise the operation of main engines when ships are getting under way, coming to anchor, and at other times when special care is necessary. They evaluate problems in the equipment and recommend action to correct problems. They review plans for installing, changing, repairing and overhauling electrical units and systems on ships and at shipyards. They inspect machinery and plan and conduct tests of machinery and systems to make sure they will operate properly. They estimate the personnel, materials, time and money that will be needed to complete engineering/repair jobs. They direct repair shops and foundries. They develop work procedures for shipyards and repair facilities. They plan, schedule, and conduct training for engineering and repair personnel. Engineering/Repair LDOs with the rank of lieutenant commander or commander may prepare budgets; they may serve as members of boards that evaluate ship designs; or they may head the planning departments of naval shipyards or repair facilities.

The work of Engineering/Repair LDOs varies, depending on rank and on the specific jobs to which they are assigned. They may work, for example, as technical instructors, as superintendents of machinery installation and repair, as Damage Control Officers, as Ship Repair Officers, as Hull Inspection Officers or Hull Superintendents, as Ship's Engineering Officers, as ship Salvage Operations Officers, as an Electrical Planning and Estimating (cost) Superintendents, as Ship's Electrical Officers or Ship's Electrical Repair Officers, or as Technical Inspectors.

## WORKING CONDITIONS

Engineering/Repair LDOs share the conditions of the personnel they supervise. Since the field is broad, including 12 different enlisted job categories, there are a variety of possible assignments. Engineering/Repair LDOs may work aboard ships of all kinds. They may be assigned to fleet commands or to shore-based activities including naval shipyards and schools. The work may be physically demanding. For example, personnel frequently may be required to do troubleshooting or repair work in very small spaces in engine rooms, where the temperature may be quite warm.

### Sea-Shore Rotation

Like other Limited Duty Officers, Engineering/Repair LDOs spend about 2-3 years on "sea duty" when they become LDOs. After that, they spend 2-3 years on "shore duty," then 1-3 years at an overseas Navy facility or 2-3 years at sea, followed again by 2-3 years ashore, and so on until retirement.

"Sea duty" includes all of the time during which an officer is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home. "Shore duty" is duty at permanent shore locations, where Engineering/Repair LDOs provide support for fleet units or for the Navy in general.

## QUALIFICATIONS

To be eligible for the position of Engineering/Repair Limited Duty Officer, personnel must first gain experience in one of the enlisted ratings in the engineering/repair field. Some enlisted personnel become Warrant Officers in the engineering/repair specialty before becoming LDOs. (Warrant Officers are generally technical specialists who have fewer management responsibilities than LDOs.) Other persons advance directly from enlisted to LDO status.

All Limited Duty Officers must acquire the general skills and knowledge appropriate for managers. They must understand the organization of the Navy, the relationships among its various units, and its role in relation to the other agencies in the Department of Defense. They must know naval history, customs and etiquette, Navy regulations, and personnel functions, rights and benefits. They must know the duties, authority, and responsibilities of officers in various categories. They must know how to plan and conduct training, and they must have the leadership skills necessary to guide personnel, develop individual responsibility, and maintain morale.

To become Engineering/Repair Limited Duty Officers, personnel must also have the technical knowledge and skills necessary to direct work in that field. The position of LDO is competitive. Personnel become LDOs by showing on the job and on qualification tests that they have superior technical and managerial capabilities.

## EMPLOYMENT OPPORTUNITY

There are presently about 565 Navy Limited Duty Officers in the engineering/repair specialty. The number of opportunities for enlisted personnel to advance to that position fluctuates, depending on the needs of the Navy. There is a relatively large number of LDO openings, because the field is large in terms of numbers of personnel employed. However, competition may be keen.

Existing legislation does not authorize appointment of Navy women to Limited Duty Officer status.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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The General Work of the Navy — Page 23
Shipboard Routine in the Navy — Page 27
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## EXPLOSIVE ORDNANCE DISPOSAL LIMITED DUTY OFFICER *

### NATURE OF THE JOB

Explosive Ordnance Disposal Limited Duty Officers (LDOs) are technical managers in the field of weapons disposal. They have responsibilities for the safe deactivation and removal of weapons, explosives, demolition materials, and chemical and biological agents used in combat. ("Ordnance" is a general term that refers to materials used in combat—guns, ammunition, rockets and missiles, mines, and associated equipment.)

The work involves detection, identification, and evaluation of the dangers of different ordnance materials. Then the materials must be made harmless on the spot or removed for deactivation and disposal. Explosive Ordnance Disposal LDOs direct and assist in those operations. They make decisions about how materials may best be handled, and they enforce safety precautions.

In addition to directing disposal operations, Explosive Ordnance Disposal LDOs coordinate storage, packaging, and transport of explosive ordnance. They manage procurement, issuing, and inventory tasks to maintain supplies of equipment and materials used in explosive ordnance work. They supervise the assembly, installation, inspection, and maintenance of equipment and materials. They direct the preparation of technical reports, manuals, bulletins and other information about explosive ordnance disposal.

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* Each Explosive Ordnance Disposal Limited Duty Officer is involved in some of the general work of the Navy as well as the work of his own specialty or occupation. It is very important for each officer to understand the general work of the Navy as well as the work of his own specialty. The first chapter of this manual describes the general work of the Navy.

They participate in and administer research programs to evaluate operations and improve equipment and techniques. They work with commercial firms on projects involving equipment, tools, and materials for explosive ordnance disposal. They advise on the capabilities of personnel and help to develop plans for the employment of personnel. They analyze costs of explosive ordnance disposal operations and prepare budget recommendations.

The work of Explosive Ordnance Disposal LDOs varies, depending on rank and on the specific job to which they are assigned. An Explosive Ordnance Disposal LDO may work, for example, as a Safety Officer, a Training Officer, an Inspection Team Officer, or as an Officer in Charge of an explosive ordnance disposal shipboard team, mobile team, or advisory team.

## WORKING CONDITIONS

Explosive Ordnance Disposal LDOs share the conditions of the personnel they supervise. They may be assigned to training centers, to shore facilities, and to all kinds of ships. They may work in the United States or overseas. Explosive ordnance disposal can be extremely hazardous. Personnel may be called upon to deactivate mines under water or to do emergency work under other difficult conditions.

### Sea-Shore Rotation

Like other Limited Duty Officers, Explosive Ordnance Disposal LDOs spend about 2-3 years on "sea duty" when they become LDOs. After that, they spend 2-3 years on "shore duty," then 1-3 years at an overseas Navy facility or 2-3 years at sea, followed again by 2-3 years ashore, and so on until retirement.

"Sea duty" includes all of the time during which an officer is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be periods away from home. "Shore duty" is duty at permanent shore locations, where Explosive Ordnance Disposal LDOs provide support for fleet units or for the Navy in general.

## QUALIFICATIONS

All personnel who want to work in the field of explosive ordnance disposal must go through intensive training. Trainees may be selected from any enlisted job category. After successfully completing training, enlisted personnel gain experience in explosive ordnance disposal. LDOs are selected from among experienced enlisted personnel.

Some enlisted personnel become Explosive Ordnance Disposal Technicians with the status of Warrant Officer before becoming LDOs.

(Warrant Officers are generally technical specialists who have fewer management responsibilities than LDOs.) Other persons advance directly from enlisted to LDO status.

All Limited Duty Officers must acquire the general skills and knowledge appropriate for managers. They must understand the organization of the Navy, the relationships among its various units, and its role in relation to the other agencies in the Department of Defense. They must know naval history, customs and etiquette, Navy regulations, and personnel functions, rights and benefits. They must know the duties, authority, and responsibilities of officers in various categories. They must know how to plan and conduct training, and they must have the leadership skills necessary to guide personnel, develop individual responsibility, and maintain morale.

To become Explosive Ordnance Disposal Limited Duty Officers, personnel must also have the technical knowledge and skills necessary to direct work in that field. The position of LDO is competitive. Personnel become LDOs by showing on the job and on qualification tests that they have superior technical and managerial capabilities.

## EMPLOYMENT OPPORTUNITY

There are presently about 30 Navy Limited Duty Officers in the explosive ordnance disposal specialty. The number of opportunities for enlisted personnel to advance to that position fluctuates, depending on the needs of the Navy.

Existing legislation does not authorize appointment of Navy women to Limited Duty Officer status.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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## INTELLIGENCE LIMITED DUTY OFFICER*

### NATURE OF THE JOB

Intelligence Limited Duty Officers (LDOs) are technical managers in the intelligence field. They have responsibilities for planning, coordinating and directing the gathering of "intelligence," which is information that is important for planning defense strategy and tactics. Usually the information if secret. Intelligence LDOs also have responsibilities for the processing and analysis of intelligence information.

Intelligence LDOs supervise and provide technical assistance to other personnel whose work involves intelligence activities or who need to use intelligence services or equipment. They train personnel in techniques of survival, evasion, escape, and resistance to physical and psychological pressures in the event of capture by enemy forces. They plan and direct photographic reconnaissance missions, attack missions, and other special missions. They maintain working relationships with schools that provide intelligence training. They prepare intelligence studies and reports of various kinds and make recommendations concerning the release, shipment, and disposal of information. They are responsible for the maintenance of accurate intelligence files and for the condition and use of equipment. Intelligence LDOs in the higher ranks take increasing responsibility for overall planning of intelligence operations. They direct training and readiness of intelligence units. They evaluate data and reports to determine their military significance. They also develop intelligence-gathering techniques.

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* Each Intelligence Limited Duty Officer is involved in some of the general work of the Navy as well as the work of his own specialty or occupation. It is very important for each officer to understand the general work of the Navy as well as the work of his own specialty. The first chapter of this manual describes the general work of the Navy.

The work of Intelligence LDOs varies, depending on rank and on the specific jobs to which they are assigned. They may work, for example, as Intelligence Officers or Assistant Intelligence Officers in aircraft squadrons or aircraft carrier divisions, at fleet intelligence centers, at the Naval Reconnaissance and Technical Support Center, or on the staffs of major naval commands. Other assignments include Instructor and Training Officer at one of the naval intelligence schools.

## WORKING CONDITIONS

Intelligence LDOs share the conditions of the personnel they supervise. Their work is usually done in an office or school setting, and they are assigned to ships, staffs and shore facilities in the United States and overseas.

### Sea-Shore Rotation

Like other Limited Duty Officers, Intelligence LDOs spend about 2-3 years on "sea duty" when they become LDOs. After that, they spend 2-3 years on "shore duty," then 1-3 years at an overseas Navy facility or 2-3 years at sea, followed again by 2-3 years ashore, and so on until retirement.

"Sea duty" includes all of the time during which an officer is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home. "Shore duty" is duty at permanent shore locations, where Intelligence LDOs provide support for fleet units or the the Navy in general.

## QUALIFICATIONS

To be eligible for the position of Intelligence Limited Duty Officer, personnel must first complete special training and serve successfully as enlisted sailors working in the intelligence field. Some enlisted personnel become Intelligence Technicians with the status of Warrant Officer before becoming LDOs. (Warrant Officers are generally technical specialists who have fewer management responsibilities than LDOs.) Other persons advance directly from enlisted to LDO status.

All Limited Duty Officers must acquire the general skills and knowledge appropriate for managers. They must understand the organization of the Navy, the relationships among its various units, and its role in relation to the other agencies in the Department of Defense. They must know naval history, customs and etiquette, Navy regulations, and personnel functions, rights and benefits. They must know the duties, authority, and responsibilities of officers in various categories. They must know standard procedures for administrative control and for operations. They must know how to plan and conduct training, and they must have the leadership skills necessary to guide personnel, develop individual responsibility, and maintain morale.

To become Intelligence LDOs, personnel must also have the technical knowledge and skills necessary to direct work in that field. The position of LDO is competitive. Personnel become LDOs by showing on the job and on qualification tests that they have superior technical and managerial capabilities.

## EMPLOYMENT OPPORTUNITY

There are presently about 10 Navy Limited Duty Officers in the intelligence specialty. The number of opportunities for enlisted personnel to advance to that position varies, depending on the needs of the Navy.

Existing legislation does not authorize appointment of Navy women to Limited Duty Officer status.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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# MESS MANAGEMENT LIMITED DUTY OFFICER*

## NATURE OF THE JOB

"Mess" is the general name given to eating places for Navy officers and enlisted personnel. Mess Management Limited Duty Officers (LDOs) supervise the operation of those eating places.

The position of Mess Management LDO is new. The Bureau of Naval Personnel has not yet published an official description of the work in that specialty. Based on the information that is available, it may be said that Mess Management LDOs direct and advise on menu planning, on the purchasing of foods and related supplies and equipment, on proper food storage and on food preparation. They estimate costs of food operations, prepare budgets, and supervise spending. They also direct food service procedures as well as cleaning and maintenance activities.

Mess Management LDOs supervise enlisted personnel in food service occupations, or "ratings." The enlisted personnel are called Mess Management Specialists. It will be helpful to read about their work to understand the variety of things a Mess Management LDO may do as a manager. A description of the enlisted rating can be found on pp. 235-237 of this book.

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* Each Mess Management Limited Duty Officer is involved in some of the general work of the Navy as well as the work of his own specialty or occupation. It is very important for each officer to understand the general work of the Navy as well as the work of his own specialty. The first chapter of this manual describes the general work of the Navy.

## WORKING CONDITIONS

Mess Management LDOs share the conditions of the personnel they supervise. They are assigned to all types of ships and shore facilities in the United States and overseas.

### Sea-Shore Rotation

Like other Limited Duty Officers, Mess Management LDOs spend about 2-3 years on "sea duty" when they become LDOs. After that, they spend 2-3 years on "shore duty," then 1-3 years at an overseas Navy facility or 2-3 years at sea, followed again by 2-3 years ashore, and so on until retirement.

"Sea duty" includes all of the time during which an officer is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home. "Shore duty" is duty at permanent shore locations, where Mess Management LDOs provide support for fleet units or for the Navy in general.

## QUALIFICATIONS

To be eligible for the position of Mess Management Limited Duty Officer, personnel must first gain experience as enlisted Mess Management Specialists. Some enlisted personnel become Warrant Officers in the food service specialty before becoming LDOs. (Warrant Officers are generally specialists who have fewer management responsibilities than LDOs.) Other persons advance directly from enlisted to LDO status.

All Limited Duty Officers must acquire the general skills and knowledge appropriate for managers. They must understand the organization of the Navy, the relationships among its various units, and its role in relation to the other agencies in the Department of Defense. They must know naval history, customs and etiquette, Navy regulations, and personnel functions, rights and benefits. They must know the duties, authority, and responsibilities of officers in various categories. They must know how to plan and conduct training, and they must have the leadership skills necessary to guide personnel, develop individual responsibility, and maintain morale.

To become Mess Management Limited Duty Officers, personnel must also have the technical knowledge and skills necessary to direct work in that field. The position of LDO is competitive. Personnel become LDOs by showing on the job and on qualification tests that they have superior technical and managerial capabilities.

## EMPLOYMENT OPPORTUNITY

There are presently about 40 Navy Limited Duty Officers in the mess management specialty. The number of opportunities for enlisted personnel to advance to that position varies, depending on the Navy's needs. Opportunities will vary, for example, with the size of the force and the number of separate facilities operated by the Navy. In general, it appears that there will be good opportunities for interested, competent personnel to advance in the field of mess management.

Existing legislation does not authorize appointment of Navy women to Limited Duty Officer status.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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# METEOROLOGY LIMITED DUTY OFFICER *

## NATURE OF THE JOB

Meteorology Limited Duty Officers (LDOs) are technical managers in the field of weather observation and reporting. (Meteorology is a branch of physics that deals with the atmosphere and its phenomena, particularly temperature, moisture, and wind.) They have responsibilities for providing the Navy's sea, air, and land units with the most accurate possible weather information.

Meteorology LDOs supervise and provide technical assistance to enlisted personnel who work in the weather field. Those personnel are called Aerographer's Mates. It will be helpful to read about their work, to understand the variety of things a Meteorology LDO may do as a manager. (See pp. 55-57 of this book for a description of the Aerographer's Mate job category, or "rating.") In general, the work includes:

- Making visual observations and monitoring weather instruments to collect information about water and atmospheric conditions.
- Operating satellite receivers to obtain information about ocean conditions and conditions in the high atmosphere

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* Each Meteorology Limited Duty Officer is involved in some of the general work of the Navy as well as the work of his specialty or occupation. It is very important for each officer to understand the general work of the Navy as well as the work of his own specialty. The first chapter of this manual describes the general work of the Navy.

- Using computer equipment to process weather data
- Interpreting, preparing, and distributing weather data, charts and reports, including hazardous weather and sea-state warnings
- Forecasting weather and water conditions
- Maintaining and repairing meteorological and oceanographic equipment and instruments.

In addition to supervising and providing technical assistance to weather personnel in the foregoing areas of work, Meteorology LDOs plan and conduct training programs for weather personnel. Meteorology LDOs also train pilots, aircrew and others in how to observe and interpret atmospheric and water conditions and how to use weather charts and reports. They interview arriving pilots and crewmen for details about weather encountered during flights, and update weather information based on flight reports. They brief pilots and crewmen on conditions along flight routes and at their destinations, and issue weather clearances for flights. They direct preparation of radioactive fallout forecasts. They direct computation of ballistic and density data for weapon firing operations, and they prepare forecasts used in planning special weapons operations. They also participate in research to develop new equipment and techniques for weather forecasting.

The work of Meteorology LDOs varies, depending on rank and on the specific jobs to which they are assigned. They may work, for example, as technical instructors, Training Officers, as Meteorological Reconnaissance Officers in air squadrons, as Meteorological Supply Management Officers or Equipment and Technical Liaison Officers, as Naval Weather Activity Administrators, or as Staff Meteorological Officers.

## WORKING CONDITIONS

Meteorology LDOs share the conditions of the personnel they supervise. They may be assigned to sea duty on large ships such as aircraft carriers or cruisers. Ashore, they may be assigned to naval air stations, to weather centers and to training schools. They may work in the United States or overseas.

### Sea-Shore Rotation

Like other Limited Duty Officers, Meteorology LDOs spend about 2-3 years on "sea duty" when they become LDOs. After that, they spend 2-3 years on "shore duty," then 1-3 years at an overseas Navy facility or 2-3 years at sea, followed again by 2-3 years ashore, and so on until retirement.

"Sea duty" includes all of the time during which an officer is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home. "Shore duty" is duty at permanent shore locations, where Meteorology LDOs provide support for fleet units or for the Navy in general.

## QUALIFICATIONS

To be eligible for the position of Meteorology Limited Duty Officer, personnel must first gain experience as enlisted workers in the Aerographer's Mate rating. Some enlisted personnel become Aerographers with the status of Warrant Officer before becoming LDOs. (Warrant Officers are generally technical specialists who have fewer management responsibilities than LDOs.) Other persons advance directly from enlisted to LDO status.

All Limited Duty Officers must acquire the general skills and knowledge appropriate for managers. They must understand the organization of the Navy, the relationships among its various units, and its role in relation to the other agencies in the Department of Defense. They must know naval history, customs and etiquette, Navy regulations, and personnel functions, rights and benefits. They must know the duties, authority, and responsibilities of officers in various categories. They must know how to plan and conduct training, and they must have the leadership skills necessary to guide personnel, develop individual responsibility, and maintain morale.

To become Meteorology Limited Duty Officers, personnel must also have the technical knowledge and skills necessary to direct work in that field. The position of LDO is competitive. Personnel become LDOs by showing on the job and on qualification tests that they have superior technical and managerial capabilities.

## EMPLOYMENT OPPORTUNITY

There are presently about 40 Navy Limited Duty Officers in the meteorology specialty. The number of opportunities for enlisted personnel to advance to that position fluctuates, depending on the needs of the Navy. There have been important developments in the techniques, instruments, and equipment used in weather science in recent years. The field is changing, growing and becoming more sophisticated. It offers good opportunities for career development.

Existing legislation does not authorize appointment of Navy women to Limited Duty Officer status.

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ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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The General Work of the Navy Page 23
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# NUCLEAR POWER LIMITED DUTY OFFICER *

## NATURE OF THE JOB

Nuclear Power Limited Duty Officers (LDOs) are technical managers in the general field of nuclear power production. The Navy has both surface ships and submarines that are driven by nuclear power. Nuclear Power LDOs have responsibilities for safe and efficient power production on those ships and submarines.

Nuclear Power LDOs are a special category of ship engineer. ("Engineer" is the general name given to personnel responsible for power production on a ship.) Their work is similar in many respects to the work of engineering officers on the more conventional ships powered by steam or diesel fuel. (See "Engineering/Repair Limited Duty Officer," pp. 427-430 of this manual.) However, nuclear power adds new dimensions to ship engineering because of the nature of the power production equipment, the dangers of the process, and the enormous power capability it provides.

The Bureau of Naval Personnel has not yet published a description of the new job category of Nuclear Power LDO. Based on the information that is available, it can be said that the job includes supervising the operation of nuclear reactors and associated equipment, planning, developing training programs, and providing advice and information about nuclear power matters to command personnel or others who may need to know.

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* Each Nuclear Power Limited Duty Officer is involved in some of the general work of the Navy as well as the work of his own specialty or occupation. It is very important for each officer to understand the general work of the Navy as well as the work of his own specialty. The first chapter of this manual describes the general work of the Navy.

Nuclear Power LDOs supervise and provide technical assistance to enlisted personnel who work in the nuclear engineering field. Those personnel are drawn from the regular ship engineering job categories, or "ratings," but they must complete intensive special training before going into nuclear power work. The enlisted ratings involved are shown below:

| Enlisted Ratings From Which Nuclear Power Personnel May Be Drawn | Pages in This Manual Where Information Can Be Found |
|---|---|
| Electrician's Mate | 150 |
| Electronics Technician | 160 |
| Interior Communications Technician | 205 |
| Machinist's Mate | 229 |

The rating descriptions cover only non-nuclear assignments. Some different skills and knowledge are required for nuclear assignments. However, the descriptions give a general idea of the kinds of work Nuclear Power LDOs may direct.

## WORKING CONDITIONS

Nuclear Power LDOs share the conditions of the personnel they supervise. They typically are assigned to nuclear ships and submarines. They may be assigned to training centers or to other shore facilities when not on sea duty. Personnel who work aboard submarines must become accustomed to fairly long periods of confinement and steady, close contact with other crew members.

### Sea-Shore Rotation

Like other Limited Duty Officers, Nuclear Power LDOs spend about 2-3 years on "sea duty" when they become LDOs. After that, they spend 2-3 years on "shore duty," then 1-3 years at an overseas Navy facility or 2-3 years at sea, followed again by 2-3 years ashore, and so on until retirement.

"Sea duty" includes all of the time during which an officer is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home. "Shore duty" is duty at permanent shore locations, where Nuclear Power LDOs provide support for fleet units or for the Navy in general.

## QUALIFICATIONS

The position of Nuclear Power Limited Duty Officer is competitive. Personnel interested in that kind of work must first be selected for intensive training at the Navy's Nuclear Power School. Trainees may be selected from among personnel in the enlisted ratings of Electrician's Mate, Electronics Technician, Machinist's Mate and Interior Communications Technician. After successfully completing training, personnel must gain experience in the nuclear power field by serving aboard nuclear ships or submarines.

Some enlisted personnel become Nuclear Power Technicians with the status of Warrant Officer before becoming LDOs. (Warrant Officers are generally technical specialists who have fewer management responsibilities than LDOs.) Other persons advance directly from enlisted to LDO status.

All Limited Duty Officers must acquire the general skills and knowledge appropriate for managers. They must understand the organization of the Navy, the relationships among its various units, and its role in relation to the other agencies in the Department of Defense. They must know naval history, customs and etiquette, Navy regulations, and personnel functions, rights and benefits. They must know the duties, authority, and responsibilities of officers in various categories. They must know how to plan and conduct training, and they must have the leadership skills necessary to guide personnel, develop individual responsibility, and maintain morale.

To become Nuclear Power Limited Duty Officers, personnel must also have the technical knowledge and skills necessary to direct work in that field. The position of LDO is competitive. Personnel become LDOs by showing on the job and on qualification tests that they have superior technical and managerial capabilities.

## EMPLOYMENT OPPORTUNITY

There are presently about 100 Navy Limited Duty Officers in the nuclear power specialty. They work on surface ships, on submarines and at shore facilities. The number of opportunities for enlisted personnel to advance to that position depends mostly on personnel turnover and on changes in the size of the Navy's nuclear ship force. It appears that opportunities for advancement to Nuclear Power LDO will be limited for some time to come because of the small number of openings.

Existing legislation does not authorize appointment of Navy women to Limited Duty Officer status.

ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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## OPERATIONS LIMITED DUTY OFFICER *

### NATURE OF THE JOB

Operations Limited Duty Officers are technical managers in the field of communications and defense information-gathering. All of the work done in the Navy is ultimately for the purpose of national defense, but many activities are support activities necessary to keep the organization running (for example, mail service, construction, ship maintenance, supply work). "Operations" refers to work that contributes directly to command and control of defense activities.

Operations LDOs supervise enlisted personnel who work in communications and information-gathering jobs related to combat or combat readiness. Most of those personnel are specialists in electricity and electronics, since advanced electrical and electronic equipment is used for shipboard communications, for target detection, and for other defense information-gathering purposes. It will be helpful to read about the following enlisted job categories, or "ratings," to understand the variety of things an Operations LDO may do as a manager:

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* Each Operations Limited Duty Officer is involved in some of the general work of the Navy as well as the work of his specialty or occupation. It is very important for each officer to understand the general work of the Navy as well as the work of his own specialty. The first chapter of this manual describes the general work of the Navy.

| Enlisted Ratings That Involve Operations Work | Pages in This Manual Where Information Can Be Found |
|---|---|
| Electrician's Mate | 150 |
| Ocean Systems Technician | 260 |
| Operations Specialist | 263 |
| Quartermaster | 291 |
| Radioman | 295 |
| Signalman | 303 |
| Sonar Technician | 308 |

In general, there are three major areas of operations work:

- Communications—aboard ship, from ship to ship, and from ship to shore
- Antisubmarine warfare operations (electronic detection and location of submarines)
- Operation of ships' combat information centers (CICs) where, among other activities, the movements of friendly and enemy ships and aircraft are monitored.

(The combat information center on a large ship is similar to the NASA control centers for space flights that have been shown on television. In the CICs, like the NASA control centers, personnel and equipment keep track of all conditions that might affect the mission. The CIC serves as a central source of information for mission command and control.)

In addition to supervising personnel and providing technical assistance in the foregoing areas of work, Operations LDOs direct the movement of ships within an assigned area and coordinate support services provided to combat ships. They coordinate the routing and movement of merchant ships in Navy operating areas and maintain diagrams and records on shipping. They schedule maintenance and repair work on ships and equipment. They develop standards for operational readiness and evaluate the performance of individual ships and units. They direct search and rescue activities, coordinating Navy efforts with those of other services. They develop communications plans, assign communications channels and frequencies to be used for different purposes, and coordinate their use. They also plan and conduct training for operations personnel.

The work of Operations LDOs varies, depending on rank and on the specific jobs to which they are assigned. For example, they may work aboard ships as Antisubmarine Officers or Radio Officers, Tactical Data System

Officers, Staff Readiness Officers, or as Communication Plans Officers. They may also work ashore as a Communications Officers or as Operations Officers.

## WORKING CONDITIONS

Operations LDOs share the conditions of the personnel they supervise. They may work aboard surface ships or submarines, or at shore facilities in the United States and overseas.

Typically, operations work is done in communications rooms or centers. Long hours and sustained concentration may be required.

### Sea-Shore Rotation

Like other Limited Duty Officers, Operations LDOs spend about 2-3 years on "sea duty" when they become LDOs. After that, they spend 2-3 years on "shore duty," then 1-3 years at an overseas Navy facility or 2-3 years at sea, followed again by 2-3 years ashore, and so on until retirement.

"Sea duty" includes all of the time during which an officer is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home. "Shore duty" is duty at permanent shore locations, where Operations LDOs provide support for fleet units or for the Navy in general.

## QUALIFICATIONS

To be eligible for the position of Operations Limited Duty Officer, personnel must first gain experience as enlisted workers in the operations field. Some enlisted personnel become Warrant Officers in the operations specialty before becoming LDOs. (Warrant Officers are generally technical specialists who have fewer management responsibilities than LDOs.) Other persons advance directly from enlisted to LDO status.

All Limited Duty Officers must acquire the general skills and knowledge appropriate for managers. They must understand the organization of the Navy, the relationships among its various units, and its role in relation to the other agencies in the Department of Defense. They must know naval history, customs and etiquette, Navy regulations, and personnel functions, rights and benefits. They must know the duties, authority, and responsibilities of officers in various categories. They must know how to plan and conduct training, and they must have the leadership skills necessary to guide personnel, develop individual responsibility, and maintain morale.

To become Operations Limited Duty Officers, personnel must also have the technical knowledge and skills necessary to direct work in that field.

The position of LDO is competitive. Personnel become LDOs by showing on the job and on qualification tests that they have superior technical and managerial capabilities.

## EMPLOYMENT OPPORTUNITY

There are presently about 230 Navy Limited Duty Officers in the operations specialty. The number of opportunities for enlisted personnel to advance to that position fluctuates, depending on the needs of the Navy. Operations is a large Navy career category that involves the important specialties of electronics; it should continue to provide good opportunities for advancement. Competition may be keen, however, because of the number of highly skilled personnel who work in operations.

Existing legislation does not authorize appointment of Navy women to Limited Duty Officer status.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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## ORDNANCE LIMITED DUTY OFFICER*

### NATURE OF THE JOB

Ordnance Limited Duty Officers (LDOs) are technical managers in the field of naval weapons and weapon systems. ("Ordnance" is a general term that refers to materials used for combat. It includes weapons and associated equipment such as gun sights and mounts, ammunition, rocket and missile launchers, etc.) They assure that the Navy's ships are properly equipped for combat. They also direct the operation of weapons and weapon systems. Ordnance LDOs supervise the activities of enlisted personnel who handle ordnance materials used on ships. It will be helpful to read about the following enlisted job categories, or "ratings," to understand the variety of things an Ordnance LDO may do as a manager:

| Enlisted Ratings That Involve Ordnance Work | Pages in This Manual Where Information Can Be Found |
|---|---|
| Fire Control Technician | 177 |
| Gunner's Mate | 182 |
| Mineman | 238 |
| Missile Technician | 242 |
| Torpedoman's Mate | 320 |

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[*] Each Ordnance Limited Duty Officer is involved in some of the general work of the Navy as well as the work of his own specialty or occupation. It is very important for each officer to understand the general work of the Navy as well as the work of his own specialty. The first chapter of this manual describes the general work of the Navy.

In general, naval ordnance work involves:

- Procurement, storage, and distribution of weapons, weapon parts, and associated equipment and materials
- Installation and repair of weapons and weapon systems
- Changing equipment, systems, and procedures based on research developments
- Inspections, tests, and evaluations of weapons and weapon systems
- Planning the stratetic use of weapons (or planning operations and logistics)

Ordnance LDOs assist in directing all of those activities. They have budget planning and cost control duties. They also plan, schedule, and conduct training programs in the ordnance field.

The work of Ordnance LDOs varies, depending on rank and on the specific jobs to which they are assigned. They may work, for example, as Weapons Officers or Fire Control Officers on large ships, as Naval Inspectors of Weapons, or as Weapons Procurement Officers based at a shore facility. Ordnance LDOs may work as Guided Missile Test Officers, Mine Repair Officers, general Weapons Maintenance Officers, Weapons Installation and Repair Superintendents, Weapons and Ammunition Production Officers, or as Underwater Munitions Project Officers in charge of advanced underseas weapons.

## WORKING CONDITIONS

Ordnance LDOs share the conditions of the personnel they supervise. They may work in shop, office, or storage facility settings. They may work aboard surface ships or submarines, or at shore facilities in the United States and overseas.

### Sea-Shore Rotation

Like other Limited Duty Officers, Ordnance LDOs spend about 2-3 years on "sea duty" when they become LDOs. After that, they spend 2-3 years on "shore duty," then 1-3 years at an overseas Navy facility or 2-3 years at sea, followed again by 2-3 years ashore, and so on until retirement.

"Sea duty" includes all of the time during which an officer is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home. "Shore duty" is duty at permanent shore locations, where Ordnance LDOs provide support for fleet units or for the Navy in general.

## QUALIFICATIONS

To be eligible for the position of Ordnance Limited Duty Officer, personnel must first gain experience in one of the enlisted ratings that involve ordnance work. Some enlisted personnel become Warrant Officers in the ordnance specialty before becoming LDOs. (Warrant Officers are generally technical specialists who have fewer management responsibilities than LDOs.) Other persons advance directly from enlisted to LDO status.

All Limited Duty Officers must acquire the general skills and knowledge appropriate for managers. They must understand the organization of the Navy, the relationships among its various units, and its role in relation to the other agencies in the Department of Defense. They must know naval history, customs and etiquette, Navy regulations, and personnel functions, rights and benefits. They must know the duties, authority, and responsibilities of officers in various categories. They must know standard procedures for administrative control and for operations. They must know how to plan and conduct training, and they must have the leadership skills necessary to guide personnel, develop individual responsibility, and maintain morale.

To become Ordnance LDOs, personnel must also have the technical knowledge and skills necessary to direct work in that field. The position of LDO is competitive. Personnel become LDOs by showing on the job and on qualification tests that they have superior technical and managerial capabilities.

## EMPLOYMENT OPPORTUNITY

There are presently about 200 Navy Limited Duty Officers in the ordnance specialty. The number of opportunities for enlisted personnel to advance to that position fluctuates, depending on the Navy's needs.

Existing legislation does not authorize appointment of Navy women to Limited Duty Officer status.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

| | |
|---|---|
| The Sailor's Rank and Occupation | Page 4 |
| The General Work of the Navy | Page 23 |
| Shipboard Routine in the Navy | Page 27 |

Shipboard Life Page 28
Lengths of Cruises and Time Between Cruises Page 30
"Shore Duty"—Work at Navy Shore Facilities Page 32
Rotation Between "Sea Duty" and "Shore Duty" Page 33
How the Navy Hires Page 35
Navy Pay Page 40
Navy Retirement Benefits Page 43
Navy Training and Education Page 44
Advancement in the Navy Page 51

# PHOTOGRAPHY LIMITED DUTY OFFICER*

## NATURE OF THE JOB

Photography Limited Duty Officers (LDOs) are technical managers of Navy photographic work. Photography is used in the Navy for reconnaissance (surveying areas by air to become familiar with land and water features, industrial development, housing patterns, and the movement of defense forces, etc.), for intelligence (collection of information about the plans and activities of opposing forces or potentially opposing forces), and for mapping and charting. Photography is also used in public information and public relations activities, in Navy newspapers, in personnel handbooks, in training materials and other publications. Motion picture and television camera work may be involved for both strategic and nonstrategic purposes.

Photography LDOs supervise enlisted personnel who do photographic work. It will be helpful to read about the following enlisted job categories, or "ratings," to understand the variety of things a Photography LDO may do as a manager:

| Enlisted Ratings That Involve Photography | Pages in This Manual Where Information Can Be Found |
|---|---|
| Illustrator-Draftsman | 196 |
| Journalist | 210 |
| Photographer's Mate | 283 |

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* Each Photography Limited Duty Officer is involved in some of the general work of the Navy as well as the work of his own specialty or occupation. It is very important for each officer to understand the general work of the Navy as well as the work of his own specialty. The first chapter of this manual describes the general work of the Navy.

In general, the work includes:

- Installation and maintenance of cameras, camera control systems, and photographic processing equipment; procurement, storage, and stock control of photographic supplies
- Camera work
- Film processing, layout and stripping, printmaking, photographic mapmaking
- Maintenance of negative and print logs and files.

In addition to supervising and providing technical assistance to enlisted personnel who perform the foregoing activities, Photography LDOs do such things as plan and conduct training, and direct preparation of technical publications dealing with Navy photography. They design shipboard photographic laboratories, and advise on the selection and installation of photographic equipment for aircraft, ships, and bases. They review requests for photography, determine the type of coverage and the equipment best suited to the purpose, and determine the time, materials and personnel required. They assign priorities to photography jobs, prepare schedules and coordinate jobs. They plot flight lines for aerial photography and brief pilots and crew members on photographic requirements. They plan motion pictures and TV presentations, and direct script-writing and set design. They work with motion picture studios that produce Navy training and information films. They coordinate photographic matters with local photographic, intelligence, and public information officers, with other Navy personnel, and with personnel from other armed services.

The work of Photography LDOs varies, depending on rank and on the specific jobs to which they are assigned. A Photography LDO, may work, for example, as a Photographic Medical Officer, as a Photographic Officer or Photographic Director, as a Motion Picture and Television Project Officer, or as a Training Officer.

## WORKING CONDITIONS

Photography LDOs share the conditions of the personnel they supervise. They may work, for example, in photographic laboratories, publication production shops, or office settings. They may be assigned to sea duty, to aircraft squadrons, or to shore facilities. Their work may involve a good deal of local travel when they are assigned to shore duty.

## Sea-Shore Rotation

Like other Limited Duty Officers, Photography LDOs spend about 2-3 years on "sea duty" when they become LDOs. After that, they spend 2-3 years on "shore duty," then 1-3 years at an overseas Navy facility or 2-3 years at sea, followed again by 2-3 years ashore, and so on until retirement.

"Sea duty" includes all of the time during which an officer is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home. "Shore duty" is duty at permanent shore locations, where Photography LDOs provide support for fleet units or for the Navy in general.

## QUALIFICATIONS

To be eligible for Photography Limited Duty Officer, personnel must first gain experience as enlisted workers in the Illustrator-Draftsman rating, the Journalist rating, or the Photographer's Mate rating. Some enlisted personnel become Warrant Officers in the photography specialty before becoming LDOs. (Warrant Officers are generally technical specialists who have fewer management responsibilities than LDOs.) Other persons advance directly from enlisted to LDO status.

All Limited Duty Officers must acquire the general skills and knowledge appropriate for managers. They must understand the organization of the Navy, the relationships among its various units, and its role in relation to the other agencies in the Department of Defense. They must know naval history, customs and etiquette, Navy regulations, and personnel functions, rights and benefits. They must know the duties, authority, and responsibilities of officers in various categories. They must know standard procedures for administrative control and for operations. They must know how to plan and conduct training, and they must have the leadership skills necessary to guide personnel, develop individual responsibility, and keep up morale.

To become Photography LDOs, personnel must also have the technical knowledge and skills necessary to direct work in that field. The position of LDO is competitive. Personnel become LDOs by showing on the job and on qualification tests that they have superior technical and managerial capabilities.

## EMPLOYMENT OPPORTUNITY

There are presently about 35 Navy Limited Duty Officers in the photography specialty. The number of opportunities for enlisted personnel to advance to that position fluctuates, depending on the needs of the Navy.

Existing legislation does not authorize appointment of Navy women to Limited Duty Officer status.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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Shipboard Routine in the Navy — Page 27
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Lengths of Cruises and Time Between Cruises — Page 30
"Shore Duty"—Work at Navy Shore Facilities — Page 32
Rotation Between "Sea Duty" and "Shore Duty" — Page 33
How the Navy Hires — Page 35
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Navy Retirement Benefits — Page 43
Navy Training and Education — Page 44
Advancement in the Navy — Page 51

# SUPPLY CORPS LIMITED DUTY OFFICERS *

## NATURE OF THE JOB

Supply Corps Limited Duty Officers (LDOs) are technical managers in the field of supply. They manage customer services and the procurement and distribution of food, materials and equipment. They are responsible for all kinds of supplies except weapons and ammunition, explosive devices, flares and other fireworks.

Supply Corps LDOs supervise enlisted personnel who work in the supply field. It will be helpful to read about the following enlisted job categories, or "ratings," to understand the variety of things a Supply Corps LDO may do as a manager:

| Enlisted Ratings That Involve Supply Work | Pages in This Manual Where Information Can Be Found |
|---|---|
| Aviation Storekeeper | 98 |
| Disbursing Clerk | 146 |
| Mess Management Specialist | 235 |
| Ship's Serviceman | 300 |
| Storekeeper | 316 |

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* Each Supply Corps Limited Duty Officer is involved in some of the general work of the Navy as well as the work of his own specialty or occupation. It is very important for each officer to understand the general work of the Navy as well as the work of his own specialty. The first chapter of this manual describes the general work of the Navy.

In addition to supervising and providing technical assistance to enlisted personnel, Supply Corps LDOs do such things as determine needs for supplies and plan and direct purchasing and distribution. They are responsible for recordkeeping and reporting procedures, loading/unloading and storage procedures, stock maintenance procedures, disposal of surpluses, and salvaging procedures. They plan, schedule and conduct training for supply personnel.

The work of Supply Corps LDOs varies, depending on rank and on the specific jobs to which they are assigned. They may work, for example, as Accounting Officers, Disbursing Officers, Commissary Officers, Freight Transportation Officers, Storage Planning and Control Officers, Clothing Officers, Cargo Handling Officers, School Administrators, or Aircraft Material Control Officers.

## WORKING CONDITIONS

Supply Corps LDOs share the conditions of the personnel they supervise. They may work in office settings, in warehouses and supply transportation centers, and in commissaries (food stores). They may be assigned to sea duty, to air squadrons, or to shore facilities. They may be assigned to duty overseas as well as in the United States.

### Sea-Shore Rotation

Like other Limited Duty Officers, Supply Corps LDOs spend about 2-3 years on "sea duty" when they become LDOs. After that, they spend 2-3 years on "shore duty," then 1-3 years at an overseas Navy facility or 2-3 years at sea, followed again by 2-3 years ashore, and so on until retirement.

"Sea duty" includes all of the time during which an officer is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home. "Shore duty" is duty at permanent shore locations, where Supply Corps LDOs provide support for fleet units or for the Navy in general.

## QUALIFICATIONS

To be eligible for the position of Supply Corps Limited Duty Officer, personnel must first gain experience in one of the enlisted ratings that involve supply work. Some enlisted personnel become Warrant Officers in the supply specialty before becoming LDOs. (Warrant Officers are generally specialists who have fewer management responsibilities than LDOs.) Other persons advance directly from enlisted to LDO status.

All Limited Duty Officers must acquire the general skills and knowledge appropriate for managers. They must understand the organization of the Navy, the relationships among its various units, and its role in relation to the other agencies in the Department of Defense. They must know naval history, customs and etiquette, Navy regulations, and personnel functions, rights and benefits. They must know the duties, authority, and responsibilities of officers in various categories. They must know standard procedures for administrative control and for operations. They must know how to plan and conduct training, and they must have the leadership skills necessary to guide personnel, develop individual responsibility, and maintain morale.

## EMPLOYMENT OPPORTUNITY

There are presently about 100 Navy Limited Duty Officers in the supply corps specialty. The number of opportunities for enlisted personnel to advance to that position fluctuates, depending on the needs of the Navy.

Existing legislation does not authorize appointment of Navy women to Limited Duty Officer status.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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# WARRANT OFFICER AEROGRAPHER *

## NATURE OF THE JOB

Warrant Officer (WO) Aerographers are technical specialists in the field of weather forecasting or meteorology. They supervise other sailors who use, operate and maintain weather forecasting and oceanographic equipment. They also supervise the recording, computation and analysis of weather data. They communicate their weather and ocean condition forecasts to Navy ships and aircraft. They may hold supervisory positions on ships or at shore stations. Sometimes they work as technical advisors to other sailors who need to know the capabilities, limitations and methods of operating meteorological and oceanographic equipment.

## WORKING CONDITIONS

WO Aerographers work on large ships such as aircraft carriers and at naval air stations and weather stations. Much of their work is done in office spaces, but they also may have to inspect meteorological equipment out of doors in all kinds of weather.

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* Each Warrant Officer Aerographer is involved in some of the general work of the Navy as well as the work of his or her own specialty or occupation. It is very important for each officer to understand the general work of the Navy as well as the work of his or her own specialty. The first chapter of this manual describes the general work of the Navy.

## Sea-Shore Rotation

Like other Warrant Officers, Aerographers spend about 3 years on "sea duty" when they become Warrants. After that, they spend 2-3 years on "shore duty," then perhaps 3 years at an overseas Navy facility or 2-3 years at sea, followed again by 2-3 years ashore, and so on until retirement.

"Sea duty" includes all of the time during which an officer is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home. "Shore duty" is duty at permanent shore locations, where WO Aerographers provide support for fleet units or for the Navy in general.

Since Navy women do not serve aboard combatant ships, women in this specialty rotate among shore facilities in the United States and overseas.

## QUALIFICATIONS

WO Aerographers must have served successfully as enlisted sailors and must compete to become Warrant Officers. Although other kinds of rated sailors could become WO Aerographers, normally only Aerographer's Mates get the specialized qualifications required of Aerographers. Information on the Aerographer's Mate rating can be found in this manual on page 55.

Aerographers, like other Warrant Officers, must have certain general qualifications, including the ability to complete ship supervision and training duties efficiently. They must also know the most important aspects of the Navy's mission, history, traditions, personnel policies, legal procedures, leadership and management techniques, communiation methods, and emergency as well as routine first aid procedures.

WO Aerographers must also be able to organize, supervise and direct the operation of a naval weather office. They must supervise other sailors who are using meteorological equipment to analyze weather data, prepare weather maps and prepare forecasts for transmission to ships or aircraft that need the information. WO Aerographers must also provide wind information to the teams that aim and fire naval guns. They also oversee the installation, maintenance, adjustment and calibration of meteorological and oceanographic equipment.

WO Aerographers provide training for pilots and aircrews and other sailors who need to know how weather forecasts are made, what they mean and how the forecasts can be used. Finally, Aerographers collect, prepare and communicate technical and safety information about meteorology and oceanography.

## EMPLOYMENT OPPORTUNITY

Approximately 20 Navy Warrant Officers are employed as Aerographers, but that number fluctuates slightly depending on the needs of the Navy. Entry into the WO Aerographer's category is competitive, and so it is limited to outstanding men and women with extensive experience in the Navy.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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"Shore Duty"—Work at Navy Shore Facilities Page 32
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# WARRANT OFFICER AVIATION BOATSWAIN *

## NATURE OF THE JOB

Warrant Officer (WO) Aviation Boatswains are technical specialists in the launching, recovery, handling and servicing of aircraft. They provide technical advice and information on all aircraft operations, on firefighting, on crash, rescue and salvage operations and on aviation fuels. They serve as air boatswains, assistant flight deck officers, assistant hangar deck officers, crash and rescue officers and line division officers.

## WORKING CONDITIONS

WO Aviation Boatswains perform fast-paced, noisy and sometimes potentially dangerous work on Navy aircraft carriers and at naval air stations ashore. Their work continues in all kinds of weather and at night. Because of their firefighting and rescue duties and because of the hazards of jet suction, jet exhaust and moving aircraft and other vehicles, WO Aviation Boatswains pay strict attention to orderly procedures and other safety techniques.

### Sea-Shore Rotation

Like other Warrant Officers, Aviation Boatswains spend about 3 years on "sea duty" when they become Warrants. After that, they spend 2-3 years

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* Each Warrant Officer Aviation Boatswain is involved in some of the general work of the Navy as well as the work of his or her own specialty or occupation. It is very important for each officer to understand the general work of the Navy as well as the work of his or her own specialty. The first chapter of this manual describes the general work of the Navy.

on "shore duty," then perhaps 3 years at an overseas Navy facility or 2-3 years at sea, followed again by 2-3 years ashore, and so on until retirement.

"Sea duty" includes all of the time during which an officer is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home. "Shore duty" is duty at permanent shore locations, where WO Aviation Boatswains provide support for fleet units or for the Navy in general.

Since Navy women do not serve aboard combatant ships, women in this specialty rotate among shore facilities in the United States and overseas.

## QUALIFICATIONS

WO Aviation Boatswains must have served successfully as enlisted sailors and must compete to become Warrant Officers. Many kinds of sailors can become WO Aviation Boatswains, but the persons who normally become Warrant Officers in this category have served as Aviation Boatswain's Mates. Their work is described beginning on page 72 of this manual.

Aviation Boatswains, like other Warrant Officers, must have certain general qualifications, including the ability to complete ship supervision and training duties efficiently. They must also know the most important aspects of the Navy's mission, history, traditions, personnel policies, legal procedures, leadership and management techniques, communication methods, and emergency as well as routine first aid procedures.

WO Aviation Boatswains must also be able to plan for and supervise the activities of other sailors in the launching, and recovery of aircraft, and all the handling, positioning, tying down, fueling and defueling tasks that naval air operations require. They direct the maintenance of catapults that fire airplanes from carrier decks; they also supervise the care of the arresting gear that catches planes when they land on carrier decks. They must know how to provide the special handling that seaplanes require. They must be able to plan and execute the operations and maintenance of firefighting, crash, rescue and salvage equipment and boats. WO Aviation Boatswains must also perform all of the administrative work, such as keeping equipment histories and submitting reports, that is required to support their primary duties.

WO Aviation Boatswains must be very knowledgeable about all naval aviation organization, procedures, techniques and publications, especially those that are related to launching, recovery and maintenance of aircraft.

## EMPLOYMENT OPPORTUNITY

Approximately 80 Navy Warrant Officers are working as Aviation Boatswains on surface ships and at shore facilities. The number of opportunities fluctuates depending on the needs of the Navy. Entry into this category is highly competitive and limited to outstanding men and women with extensive experience in the Navy.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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Shipboard Life Page 28
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"Shore Duty"—Work at Navy Shore Facilities Page 32
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# WARRANT OFFICER AVIATION MAINTENANCE TECHNICIAN *

## NATURE OF THE JOB

Warrant Officer (WO) Aviation Maintenance Technicians are specialists in the field of aircraft maintenance. They may serve as assistants to aircraft maintenance officers, as power plants branch officers or as air frames branch officers. They also work as technical advisors concerning the capabilities, limitations and reliability of aircraft engines, accessories, air frames (the bodies of planes) and ground support, safety and survival equipment.

## WORKING CONDITIONS

WO Aviation Maintenance Technicians work on aircraft, in hangars aboard aircraft carriers or at naval air stations, and in offices where they carry out planning and administrative duties. When they are working on a flight line, they continue their work in weather good and bad, and there is often a high level of noise in the vicinity. They are required to pay close attention to safety to avoid hazards such as jet engine suction, jet exhaust, spinning propellers and moving aircraft.

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* Each Warrant Officer Aviation Maintenance Technician is involved in some of the general work of the Navy as well as the work of his or her own specialty or occupation. It is very important for each officer to understand the general work of the Navy as well as the work of his or her own specialty. The first chapter of this manual describes the general work of the Navy.

## Sea-Shore Rotation

Like other Warrant Officers, Aviation Maintenance Technicians spend about 3 years on "sea duty" when they become Warrants. After that, they spend 2-3 years on "shore duty," then perhaps 3 years at an overseas Navy facility or 2-3 years at sea, followed again by 2-3 years ashore, and so on until retirement.

"Sea duty" includes all of the time during which an officer is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home. "Shore duty" is duty at permanent shore locations, where WO Aviation Maintenance Technicians provide support for fleet units or for the Navy in general.

Since Navy women do not serve aboard combatant ships, women in this specialty rotate among shore facilities in the United States and overseas.

## QUALIFICATIONS

WO Aviation Maintenance Technicians must have served successfully as enlisted sailors and must compete to become Warrant Officers. Many kinds of sailors who are involved with aircraft can become WO Aviation Maintenance Technicians. The personnel who normally become Warrant Officers in this category are sailors in the ratings listed below.

| Enlisted Ratings | Pages in This Manual Where Information Can Be Found |
|---|---|
| Aircrew Survival Equipmentman | 62 |
| Aviation Machinist's Mate | 87 |
| Aviation Maintenance Administrationman | 91 |
| Aviation Structural Mechanic | 101 |
| Aviation Support Equipment Technician | 106 |

Aviation Maintenance Technicians, like other Warrant Officers, must have certain general qualifications, including the ability to complete ship supervision and training duties efficiently. They must also know the most important aspects of the Navy's mission, history, traditions, personnel policies, legal procedures, leadership and management techniques, communication methods, and emergency as well as routine first aid procedures.

WO Aviation Maintenance Technicians must also be able to plan, supervise and execute three types of activities that assure aircraft safety and effectiveness:

- They are responsible for the operation and upkeep of aircraft shops and for the coordination of shop activities with the work of other shops in naval air units; they plan and direct scheduled maintenance on all aircraft, including the use of machine, hand and power tools and testing devices; they keep track of all regular inspections of aircraft; they plan and direct work that is done to prevent corrosion of the bodies of planes.
- WO Aviation Maintenance Technicians must also perform all the administrative work that is needed to assure that maintenance tasks are being completed properly.
- They also plan and conduct training of pilots and aircrewmen in the capabilities and limitations of the aircraft they fly and of ground support, safety and survival equipment.

## EMPLOYMENT OPPORTUNITY

Approximately 235 Navy Warrant Officers are employed as Aviation Maintenance Technicians on surface ships and at shore facilities. The number of opportunities for enlisted personnel to advance to this category fluctuates depending on the needs of the Navy. Entry into the category is highly competitive and is limited to outstanding men and woman with extensive experience.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

| | |
|---|---|
| The Sailor's Rank and Occupation | Page 4 |
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## WARRANT OFFICER AVIATION OPERATIONS TECHNICIAN *

### NATURE OF THE JOB

Warrant Officer (WO) Aviation Operations Technicians are specialists in the field of air traffic control. They guide Navy aircraft takeoffs, landings, and approaches for landing. They may work in control towers, where visual means and radio communications are used to direct aircraft movement. They may also work in radar centers, where they direct and monitor aircraft movement guided by radar instruments. WO Aviation Operations Technicians serve as traffic controllers themselves, and they supervise and train other personnel who work in the field of air traffic control. They also serve as technical advisors to command and staff personnel on air traffic control procedures and techniques.

### WORKING CONDITIONS

WO Aviation Operations Technicians may work at naval air stations ashore or aboard aircraft carriers. The work can be mentally taxing. It frequently requires sustained concentration and quick, accurate judgment. WO Aviation Operations personnel do most of their work in control towers at airfields or in radar centers, which are instrument rooms in where personnel monitor and operate radars.

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* Each Warrant Officer Aviation Operations Technician is involved in some of the general work of the Navy as well as the work of his or her own specialty or occupation. It is very important for each officer to understand the general work of the Navy as well as the work of his or her own specialty. The first chapter of this manual describes the general work of the Navy.

## Sea-Shore Rotation

Like other Warrant Officers, Aviation Operations Technicians spend about 3 years on "sea duty" when they become Warrants. After that, they spend 2-3 years on "shore duty," then perhaps 3 years at an overseas Navy facility or 2-3 years at sea, followed again by 2-3 years ashore, and so on until retirement.

"Sea duty" includes all of the time during which an officer is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home. "Shore Duty" is duty at permanent shore locations, where WO Aviation Operations Technicians provide support for fleet units or for the Navy in general.

Since Navy women do not serve aboard combatant ships, women in this specialty rotate among shore facilities in the United States and overseas.

## QUALIFICATIONS

WO Aviation Operations Technicians must have served successfully as enlisted sailors and must compete to become Warrant Officers. The usual way of becoming a Warrant Officer in the Aviation Operations specialty is to get training and experience as an enlisted sailor in the Air Controlman rating. (That rating, or job category, is described on p. 58 of this manual.) Sailors in other enlisted ratings could advance to the position of WO Aviation Operations Technician, but it would be difficult for them to do so.

Aviation Operations Technicians, like other Warrant Officers must have certain general qualifications, including the ability to complete ship supervision and training duties efficiently. They must also know the most important aspects of the Navy's mission, history, traditions, personnel policies, legal procedures, leadership and management techniques, communication methods, and emergency as well as routine first aid procedures.

WO Aviation Operations Technicians must also know the complete organization and duties of the air operations departments at naval air stations and on aircraft carriers. They must know the civilian and Navy regulations, as well as the joint regulations for air traffic control. They must know the sources and uses of all kinds of information pertinent to air traffic control operations. They must know how to process flight clearances and conduct flight facility checks. They must know communications procedures for air traffic control, how to plot and report aircraft movement, and how to obtain and interpret weather data. They must also know administrative procedures for ordering, storing, maintaining, and accounting for air traffic control equipment and materials.

## EMPLOYMENT OPPORTUNITY

Approximately 43 Navy Warrant Officers are working as Aviation Operations Technicians. The number of opportunities for enlisted men and women to advance to that position fluctuates, depending on the needs of the Navy. The position is competitive. It demands excellent skills and a high degree of responsibility, so it is limited to outstanding, experienced sailors. However, since air defense continues to grow in importance, there appear to be good opportunities in the aviation operations specialty for personnel who develop their abilities.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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Rotation Between "Sea Duty" and "Shore Duty" — Page 33
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# WARRANT OFFICER AVIATION ORDNANCE TECHNICIAN *

## NATURE OF THE JOB

Warrant Officer (WO) Aviation Ordnance Technicians are technical specialists who keep aircraft ordnance (guns, missiles, ammunition, explosives and flares) working safely and effectively. They supervise the arming of aircraft. They order, store, handle, test, assemble, install, maintain and repair aircraft guns, rocket launchers and missiles. WO Aviation Ordnance Technicians also ensure that other sailors obey safety regulations and precautions when they are handling ordnance. Sometimes they work as expert advisors to other officers who need to know the capabilities, limitations and reliability of aircraft weapons.

## WORKING CONDITIONS

WO Aviation Ordnance Technicians work on aircraft, in repair shops, in ammunition storage areas aboard carriers, or at naval air stations. Much of their work is done outdoors in all kinds of weather. Often there is a high level of noise in the vicinity. When they are working on a flight deck, the additional hazards of jet engine suction, jet exhaust, spinning propellers and moving aircraft may be present.

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* Each Warrant Officer Aviation Ordnance Technician is involved in some of the general work of the Navy as well as the work of his or her own specialty or occupation. It is very important for each officer to understand the general work of the Navy as well as the work of his or her own specialty. The first chapter of this manual describes the general work of the Navy.

At times, WO Aviation Ordnance Technicians work in office spaces where they complete their planning and administrative duties.

Sea-Shore Rotation

Like other Warrant Officers, Aviation Ordnance Technicians spend about 3 years on "sea duty" when they become Warrants. After that, they spend 2-3 years on "shore duty," then perhaps 3 years at an overseas Navy facility or 2-3 years at sea, followed again by 2-3 years ashore, and so on until retirement.

"Sea duty" includes all of the time during which an officer is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home. "Shore duty" is duty at permanent shore locations, where WO Aviation Ordnance Technicians provide support for fleet units or for the Navy in general.

Since Navy women do not serve aboard combatant ships, women in this specialty rotate among shore facilities in the United States and overseas.

## QUALIFICATIONS

WO Aviation Ordnance Technicians must have served as enlisted sailors and must compete to become Warrant Officers. Many kinds of sailors are involved with weapons or aircraft and can become WO Aviation Ordnance Technicians, but the personnel who normally work in this category have been either Aviation Ordnancemen or Gunner's Mates. Information on those Navy ratings can be found in this book on pages 94 and 182.

Aviation Ordnance Technicians, like other Warrant Officers must have certain general qualifications, including the ability to complete ship supervision and training duties efficiently. They must also know the most important aspects of the Navy's mission, history, traditions, personnel policies, legal procedures, leadership and management techniques, communication methods, and emergency as well as routine first aid procedures.

WO Aviation Ordnance Technicians must also be able to demonstrate all the technical abilities required by their position. They have to know how to follow precise procedures for inspecting, replacing, assembling, adjusting testing and maintaining all kinds of aviation weapons. They must follow directions from various manuals to assure that all of this work is done correctly. They keep accurate records of all ammunition that is ordered, stored or used, and they issue reports concerning the effectiveness of weapons and the number of repairs the weapons require. Finally they train pilots and aircrews in the use, capabilities and limitations of aviation weapons.

## EMPLOYMENT OPPORTUNITY

Approximately 140 Navy Warrant Officers are employed as WO Aviation Ordnance Technicians on aircraft carriers and at shore facilities. The number of opportunities for enlisted personnel to advance to this category fluctuates depending on the needs of the Navy. Entry into this category is competitive, and so it is limited to outstanding men and women with extensive experience in the Navy.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

The Sailor's Rank and Occupation Page 4
The General Work of the Navy Page 23
Shipboard Routine in the Navy Page 27
Shipboard Life Page 28
Lengths of Cruises and Time Between Cruises Page 30
"Shore Duty"—Work at Navy Shore Facilities Page 32
Rotation Between "Sea Duty" and "Shore Duty" Page 33
How the Navy Hires Page 35
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## WARRANT OFFICER AVIONICS TECHNICIAN *

### NATURE OF THE JOB

Warrant Officer (WO) Avionics Technicians are technical specialists who work to keep all the electronic equipment on aircraft working effectively. They supervise and direct practices and procedures for servicing, testing, and maintaining aviation electrical and electronic instruments and test devices. They serve in a variety of supervisory positions on ships and at shore facilities and as technical advisors to other officers who need to know the uses, capabilities and reliability of avionics equipment and test devices.

### WORKING CONDITIONS

WO Aviation Avionics work in electroncs shops or on the aircraft, aboard aircraft carriers and at shore facilities. Much of their work is done outdoors in weather good or bad. They often work on a flight line or on the flight deck of an aircraft carrier, where they are exposed to a variety of hazards, including high noise levels, jet engine suction, jet exhaust, spinning propellers and moving aircraft. Because of those hazards, WO Avionics Technicians must follow safety regulations precisely and be alert for unexpected dangers.

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* Each Warrant Officer Avionics Technician is involved in some of the general work of the Navy as well as the work of his or her own specialty or occupation. It is very important for each officer to understand the general work of the Navy as well as the work of his or her own specialty. The first chapter of this manual describes the general work of the Navy.

At times, WO Avionics Technicians work in office spaces where they do their planning and administrative work.

## Sea-Shore Rotation

Like other Warrant Officers, Avionics Technicians spend about 3 years on "sea duty" when they become Warrants. After that, they spend 2-3 years on "shore duty," then perhaps 3 years at an overseas Navy facility or 2-3 years at sea, followed again by 2-3 years ashore, and so on until retirement.

"Sea duty" includes all of the time during which an officer is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home. "Shore duty" is duty at permanent shore locations, where WO Avioncs Technicians provide support for fleet units or for the Navy in general.

Since Navy women do not serve aboard combatant ships, women in this specialty rotate among shore facilities in the United States and overseas.

## QUALIFICATIONS

WO Avionics Technicians must have served successfully as enlisted sailors and must compete to become Warrant Officers. Many kinds of sailors who are involved with electronics or aircraft can become WO Avionics Technicians. The personnel who normally become Warrant Officers in this category are sailors in the ratings listed below.

| Enlisted Ratings | Pages in This Manual Where Information Can Be Found |
|---|---|
| Aviation Antisubmarine Warfare Technician | 68 |
| Aviation Electrician's Mate | 76 |
| Aviation Electronics Technician (Enlisted) | 80 |
| Aviation Fire Control Technician | 84 |
| Tradevman | 325 |

Avionics Technicians, like other Warrant Officers must have certain general qualifications, including the ability to complete ship supervision and training duties efficiently. They must also know the most important aspects of the Navy's mission, history, traditions, personnel policies, legal procedures, leadership and management techniques, communication methods, and emergency as well as routine first aid procedures.

WO Avionics Technicians must also be able to organize, supervise and direct avionics maintenance facilities. They must be able to design and conduct an active preventive maintenance program as well as supervise the repair of avionics equipment breakdowns. They coordinate the avionics work with all the other maintenance work that has to be done on airplanes. They take action to prevent and control corrosion. They conduct inspections and keep precise records so that they can evaluate the quality of the maintenance work they are supervising. Finally, WO Avionics Technicians must train pilots and aircrews in the capabilities, limitations and use of the avionics components on their airplanes.

In order to do all this work, Warrant Officers in this category must know thoroughly all the aspects of the Navy avionics maintenance organization and administrative procedures as well as the avionics devices and testing procedures.

## EMPLOYMENT OPPORTUNITY

Approximately 200 Navy Warrant Officers are employed as Avionics Technicians on aircraft carriers and at shore facilities. The number of opportunities for enlisted personnel to advance to this category fluctuates depending on the needs of the Navy. Entry into this category is competitive and is limited to outstanding men and women with extensive experience.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

The Sailor's Rank and Occupation Page 4
The General Work of the Navy Page 23
Shipboard Routine in the Navy Page 27
Shipboard Life Page 28
Lengths of Cruises and Time Between Cruises Page 30
"Shore Duty"—Work at Navy Shore Facilities Page 32
Rotation Between "Sea Duty" and "Shore Duty" Page 33
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## WARRANT OFFICER BANDMASTER *

### NATURE OF THE JOB

Warrant Officer (WO) Bandmasters are specialists in the field of music. They teach, arrange and transcribe music, and they conduct bands and other performing groups in the Navy's music program. They assist in the administrative work required to operate the music programs. They also serve as members of examining boards that evaluate the abilities of applicants to the music program, of candidates for promotion in the program, and of potential music instructors.

### WORKING CONDITIONS

WO Bandmasters share the conditions of the personnel they supervise. They may work at the Navy School of Music, at large shore stations, and sometimes aboard ships. They often travel locally and may go on performing tours. Navy musicians perform in parades, honors ceremonies and other official occasions, at social events, and in concerts. They perform for Navy personnel and for the general public. Their work includes live performances, recording, and radio and television performances.

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* Each Warrant Officer Bandmaster is involved in some of the general work of the Navy as well as the work of his or her own specialty or occupation. It is very important for each officer to understand the general work of the Navy as well as the work of his or her own specialty. The first chapter of this manual describes the general work of the Navy.

## QUALIFICATIONS

WO Bandmasters must be highly proficient musicians and must have served successfully as enlisted sailors in the music program. WO Bandmasters are selected from among enlisted personnel in the Musician job category or "rating." (See pp. 252-256 of this book for a description of that rating.)

Bandmasters, like other Warrant Officers, must have certain general qualifications, including the ability to complete ship supervision and training duties efficiently. They must also know the most important aspects of the Navy's mission, history, traditions, personnel policies, legal procedures, leadership and management techniques, communication methods, and emergency as well as routine first aid procedures.

WO Bandmasters must also be able to demonstrate all of the knowledge and technical and managerial capabilities needed to supervise music activities. They must know, for example, the titles, composers and arrangers of published band compositions. They must know musical forms, harmony and instrumentation, and other aspects of music theory. They must know how to apply music theory in arranging, transcribing and transposing music, as well as in conducting. They must know the principles and uses of sound generators, resonators, and amplifiers of various instruments. They must know Navy regulations concerning music for military ceremonies such as reviews, parades, funerals, inspections and escorts. They must have administrative skills and knowledge too, in such areas as personnel regulations, music materials and supplies, inventory, and procedures for maintaining music libraries.

## EMPLOYMENT OPPORTUNITY

Approximately 15 Navy Warrant Officers are employed as Bandmasters. The number of opportunities for enlisted men and women to advance to Warrant Officer status in the Bandmaster category depends mostly on turnover, so the Navy requirement for Bandmasters remains fairly stable.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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The General Work of the Navy — Page 23
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"Shore Duty"—Work at Navy Shore Facilities Page 32
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## WARRANT OFFICER BOATSWAIN *

### NATURE OF THE JOB

Warrant Officer (WO) Boatswains are specialists in the operation and care of ships. They may serve as assistants to other officers in the performance of bridge, deck, division and repair party duties. They may also take charge of yard craft or harbor tugs or supervise the operation of guns on small ships. WO Boatswains sometimes supervise sailors who are engaged in preserving ships' hulls, superstructures and spaces (rooms on ships), and sailors who are maintaining, repairing or operating ships' equipment. WO Boatswains also supervise cargo handling and stowage work. They are responsible for all work, except engine maintenance, that is involved in the care of small boats and landing craft.

### WORKING CONDITIONS

WO Boatswains share the same conditions of weather and noise as the personnel they supervise and assist. Sometimes, however, WO Boatswains carry out planning and administrative functions in office spaces aboard ships and ashore.

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* Each Warrant Officer Boatswain is involved in some of the general work of the Navy as well as the work of his or her own specialty or occupation. It is very important for each officer to understand the general work of the Navy as well as the work of his or her own specialty. The first chapter of this manual describes the general work of the Navy.

## Sea-Shore Rotation

Like other Warrant Officers, Boatswains spend about 3 years on "sea duty" when they become Warrants. After that, they spend 2-3 years on "shore duty," then perhaps 3 years at an overseas Navy facility or 2-3 years at sea, followed again by 2-3 years ashore, and so on until retirement.

"Sea duty" includes all of the time during which an officer is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home. "Shore duty" is duty at permanent shore locations, where WO Boatswains provide support for fleet units or for the Navy in general.

Since Navy women do not serve aboard combatant ships, women in this specialty rotate among shore facilities in the United States and overseas.

## QUALIFICATIONS

Warrant Officer Boatswains must have served successfully as enlisted sailors and must compete to become Warrant Officers. Many kinds of rated sailors can become WO Boatswains, but Boatswain's Mates, Quartermasters and Signalmen are the sailors who advance to that position most frequently. Information on those Navy ratings can be found on pages 109, 291 and 303 of this book.

Boatswains, like other Warrant Officers must have certain general qualifications, including the ability to complete ship supervision and training duties efficiently. They must also know the most important aspects of the Navy's mission, history, traditions, personnel policies, legal procedures, leadership and management techniques, communication methods, and emergency as well as routine first aid procedures.

In addition, WO Boatswains must be prepared to carry out all the planning, supervising and operating duties that their technical specialty demands. They must know their ships, equipment, and their team members' abilities thoroughly. They must also know all the Navy and international regulations concerning ship and boat safety, and the effects of weather and current on the operation of a ship. They must also know about amphibious operations.

## EMPLOYMENT OPPORTUNITY

Approximately 225 Navy Warrant Officers serve as Boatswains. The number of opportunities varies over time depending on the needs of the Navy. Entry into the WO Boatswain category is highly competitive, and so it is limited to outstanding men and women with extensive experience in the Navy.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

The Sailor's Rank and Occupation Page 4
The General Work of the Navy Page 23
Shipboard Routine in the Navy Page 27
Shipboard Life Page 28
Lengths of Cruises and Time Between Cruises Page 30
"Shore Duty"—Work at Navy Shore Facilities Page 32
Rotation Between "Sea Duty" and "Shore Duty" Page 33
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## WARRANT OFFICER CIVIL ENGINEER CORPS *

### NATURE OF THE JOB

Civil Engineer Corps Warrant Officers are specialists in the fields of construction, utilities, maintenance and transportation. They supervise other sailors who are involved in setting up, maintaining and repairing buildings, airfields, waterfront structures, and utilities such as water and electrical systems. They also supervise the operation, testing and maintenance of all the equipment involved in their work. Civil Engineer Corps Warrant Officers work as assistants to commanding officers and to officers in charge of detachments of naval construction forces and as public works officers.

### WORKING CONDITIONS

Civil Engineer Corps Warrant Officers work at naval shore facilities and with mobile construction battalions throughout the world. In the United States, they work at construction schools, construction battalion centers, amphibious bases and public works departments at other shore stations.

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* Each Civil Engineer Corps Warrant Officer is involved in some of the general work of the Navy as well as the work of his or her own specialty or occupation. It is very important for each officer to understand the general work of the Navy as well as the work of his or her own specialty. The first chapter of this manual describes the general work of the Navy.

QUALIFICATIONS

Civil Engineer Corps Warrant Officers must have served successfully as enlisted sailors and must compete to become Warrant Officers. Although many kinds of rated sailors can become Civil Engineer Corps Warrant Officers, the sailors that do so usually have held one of the following ratings:

| Enlisted Ratings | Pages in This Manual Where Information Can Be Found |
|---|---|
| Builder | 119 |
| Construction Electrician | 126 |
| Construction Mechanic | 130 |
| Engineering Aid | 163 |
| Equipment Operator | 173 |
| Illustrator-Draftsman | 196 |
| Steelworker | 313 |
| Utilitiesman | 328 |

Civil Engineer Corps Warrant Officers must have certain general qualifications, including the ability to complete ship supervision and training duties efficiently. They must also know the most important aspects of the Navy's mission, history, traditions, personnel policies, legal procedures, leadership and management techniques, communication methods, and emergency as well as routine first aid procedures.

Civil Engineer Corps Warrant Officers must also be able to supervise the operations of sailors involved in the full range of activities that civilian civil engineers conduct. Lighting, power distribution, telephone communication, and sewage disposal are their responsibility. At times they must supervise the building and repair of those systems as well as railroad tracks, roads, piers and docking facilities. They must also oversee the operation, maintenance and repair of steam, electricity, compressed air, water and natural gas distribution systems.

The Navy Civil Engineer Corps must work closely with Marines and Army soldiers in training for amphibious operations. Because of this relationship that requires them to operate on land as a combat unit, Civil Engineer Corps Warrant Officers must know how to command a platoon or company in defensive combat operations. Women in this specialty would not be assigned to combat operations.

Like civilian civil engineers, Navy Warrant Officers in this category must be very good at planning and estimating. They must determine the time, labor, material and cost required to complete the projects that the Navy needs to have done. Finally they must be able to perform all the administrative work that supports their construction, maintenance and repair activities.

## EMPLOYMENT OPPORTUNITY

Approximately 25 Navy Warrant Officers are working in the Navy Civil Engineer Corps, primarily at naval shore facilities. The number of opportunities for enlisted men and women to enter the Warrant Officer category fluctuates depending on the needs of the Navy. Entry into the small number of Civil Engineer Warrant Officer positions is highly competitive, and so it is limited to outstanding men and women with extensive experience in the Navy.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

| | |
|---|---|
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| Lengths of Cruises and Time Between Cruises | Page 30 |
| "Shore Duty"—Work at Navy Shore Facilities | Page 32 |
| Rotation Between "Sea Duty" and "Shore Duty" | Page 33 |
| How the Navy Hires | Page 35 |
| Navy Pay | Page 40 |
| Navy Retirement Benefits | Page 43 |
| Navy Training and Education | Page 44 |
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# WARRANT OFFICER COMMUNICATIONS TECHNICIAN *

## NATURE OF THE JOB

Warrant Officer (WO) Communications Technicians are specialists in radio and electronic communications and information-gathering. Their duties relate to tactical and strategic communication as well as to routine administrative communications. They serve as technical and operational assistants on the staffs of various Navy commands. They may also be assigned to the Naval Security Group and may serve as officers in charge of units in the Naval Security Group.

WO Communication Technicians supervise enlisted personnel who are specialists in radio communications, in the operation, maintenance and repair of electronic equipment, in languages or mathematical analysis, or in some other relevant specialty. Personnel in the communications field may be assigned to sea duty or to shore facilities in the United States and overseas. Details about their duties and working conditions are not available to the general public because of the confidential nature of the work.

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* Each Warrant Officer Communications Technician is involved in some of the general work of the Navy as well as the work of his or her own specialty or occupation. It is very important for each officer to understand the general work of the Navy as well as the work of his or her own specialty. The first chapter of this manual describes the general work of the Navy.

### Sea-Shore Rotation

Like other Warrant Officers, Communications Technicians spend about 3 years on "sea duty" when they become Warrants. After that, they spend 2-3 years on "shore duty," then perhaps 3 years at an overseas Navy facility or 2-3 years at sea, followed again by 2-3 years ashore, and so on until retirement.

"Sea duty" includes all of the time during which an officer is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home. "Shore duty" is duty at permanent shore locations, where WO Communications Technicians provide support for fleet units or for the Navy in general.

Since Navy women do not serve aboard combatant ships, women in this specialty rotate among shore facilities in the United States and overseas.

## QUALIFICATIONS

The position of Warrant Officer in the Communications Technician category is competitive. Personnel who want to advance to Warrant Officer status must serve successfully as enlisted sailors in the Communications Technician job category or "rating." (See pp. 122-125 of this book for a description of that rating.) Candidates must also pass qualifications tests in their field.

Communications Technicians, like other Warrant Officers must have certain general qualifications, including the ability to complete ship supervision and training duties efficiently. They must also know the most important aspects of the Navy's mission, history, traditions, personnel policies, legal procedures, leadership and management techniques, communication methods, and emergency as well as routine first aid procedures.

In general, to advance to Warrant Officer status, personnel must show that they have the technical knowledge and skills for highly competent work in their field. They must also have the motivation and managerial capabilities needed to supervise other workers in the communications field.

## EMPLOYMENT OPPORTUNITY

Approximately 170 Navy Warrant Officers are employed as Communications Technicians on surface ships, on submarines, and at shore facilities. The number of opportunities for enlisted men and women to advance to Warrant Officer status fluctuates, depending on the needs of the Navy. Since the communications field requires workers with special, advanced skills, competition for promotion in the field may be keen. Warrant Officers in the Communications Technician category must be outstanding men and women with extensive experience in the Navy.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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The General Work of the Navy Page 23
Shipboard Routine in the Navy Page 27
Shipboard Life Page 28
Lengths of Cruises and Time Between Cruises Page 30
"Shore Duty"—Work at Navy Shore Facilities Page 32
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# WARRANT OFFICER DATA PROCESSING TECHNICIAN *

## NATURE OF THE JOB

Warrant Officer (WO) Data Processing Technicians are specialists in the automatic data processing (ADP) field. They work with both electric accounting equipment and electronic digital computers. They are responsible for a variety of types of data—strategic and tactical, scientific, business, and logistics data. As examples, they may be responsible for processing data from electronic target detection and tracking operations, for testing tactics by means of mathematical simulation models, for processing information on atmospheric conditions to be used in weather reports, for processing payroll data, and for maintaining up-to-date computerized records on the location and movement of personnel, materials, and equipment.

WO Data Processing Technicians may work as ADP system administrators, as machine processing officers, and as systems analysts. They serve as technical advisors on equipment and processing techniques; they supervise the preparation of data for processing; and they supervise the operation of all ADP equipment.

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* Each Warrant Officer Data Processing Technician is involved in some of the general work of the Navy as well as the work of his or her own specialty or or occupation. It is very important for each officer to understand the general work of the Navy as well as the work of his or her own specialty. The first chapter of this manual describes the general work of the Navy.

## WORKING CONDITIONS

WO Data Processing Technicians share the working conditions of the personnel they supervise. They may work aboard ships or at shore stations. Normally their working time is divided between computer centers or rooms and office-type settings.

### Sea-Shore Rotation

Like other Warrant Officers, Data Processing Technicians spend about 3 years on "sea duty" when they become Warrants. After that, they spend 2-3 years on "shore duty," then perhaps 3 years at an overseas Navy facility or 2-3 years at sea, followed again by 2-3 years ashore, and so on until retirement.

"Sea duty" includes all of the time during which an officer is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home. "Shore duty" is duty at permanent shore locations, where WO Data Processing Technicians provide support for fleet units or for the Navy in general.

Since Navy women do not serve aboard combatant ships, women in this specialty rotate among shore facilities in the United States and overseas.

## QUALIFICATIONS

WO Data Processing Technicians must have served successfully as enlisted sailors and must compete to become Warrant Officers. Warrant Officers in the data processing specialty are selected from among enlisted Data Processing Technicians or Data Systems Technicians. (See pp. 134 and 138 of this book for descriptions of those two enlisted job categories, or "ratings.")

Data Processing Technicians, like other Warrant Officers must have certain general qualifications, including the ability to complete ship supervision and training duties efficiently. They must also know the most important aspects of the Navy's mission, history, traditions, personnel policies, legal procedures, leadership and management techniques, communication methods, and emergency as well as routine first aid procedures.

To achieve Warrant Officer status, Data Processing Technicians must also be able to demonstrate all of the knowledge and technical and management capabilities necessary to supervise workers in that field. Successful candidates for Warrant Officer must know for example, the organization and functions of ADP installations ashore and afloat, and they must know what is required to prepare an ADP site and to install the equipment. They must know how to operate, test and adjust the equipment and do routine maintenance. They must know principles of electricity and electronics that apply to ADP equipment. In addition, they must be familiar with administrative procedures for ordering, issuing and inventorying ADP supplies and repair parts, for cost control, and for reporting on operations.

## EMPLOYMENT OPPORTUNITY

Approximately 30 Navy Warrant Officers are employed as Data Processing Technicians on surface ships, on submarines, and at shore facilities. The number of opportunities for enlisted men and women to advance in the Data Processing category fluctuates, depending on the Navy's needs. Data processing is a field in which there is a growing demand for personnel, but there is also widespread interest in going into that field. The position of Warrant Officer in Data Processing is highly competitive. Enlisted men and women who want to advance to officer status must show a high level of competence in their work.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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"Shore Duty"—Work at Navy Shore Facilities — Page 32
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# WARRANT OFFICER ELECTRONICS TECHNICIAN *

## NATURE OF THE JOB

Warrant Officer (WO) Electronics Technicians are specialists in electronic theory, equipment and systems used in navigation, in communications, and in the detection, tracking, recognition, and identification of ships, aircraft and missiles. They serve as assistants to electronic material officers and electronic repair officers. They supervise other sailors who are involved in installing, modifying, testing, calibrating, maintaining and repairing electronic equipment (not including internal communications and fire control devices). They serve as expert troubleshooters who analyze problems with equipment and operations, find solutions, and take corrective action.

## WORKING CONDITIONS

WO Electronics Technicians share the working conditions of the personnel they supervise. Because modern Navy ships have electronic devices for so many purposes, WO Electronics Technicians may work indoors or outdoors, on surface ships and submarines, and at shore facilities. Their work may be done at the place where equipment normally operates or in a shop.

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* Each Warrant Officer Electronics Technician is involved in some of the general work of the Navy as well as the work of his or her own specialty or occupation. It is very important for each officer to understand the general work of the Navy as well as the work of his or her own specialty. The first chapter of this manual describes the general work of the Navy.

## Sea-Shore Rotation

Like other Warrant Officers, Electronics Technicians spend about 3 years on "sea duty" when they become Warrants. After that, they spend 2-3 years on "shore duty," then perhaps 3 years at an overseas Navy facility or 2-3 years at sea, followed again by 2-3 years ashore, and so on until retirement.

"Sea duty" includes all of the time during which an officer is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home. "Shore duty" is duty at permanent shore locations, where WO Electronics Technicians provide support for fleet units or for the Navy in general.

Since Navy women do not serve aboard combatant ships, women in this specialty rotate among shore facilities in the United States and overseas.

## QUALIFICATIONS

WO Electronics Technicians must have served successfully as enlisted sailors and must compete to become Warrant Officers. Although many kinds of sailors are involved with electronic equipment and can become WO Electronics Technicians, the personnel who normally become Warrant Officers in this category are sailors in the ratings listed below.

| Enlisted Ratings | Pages in This Manual Where Information Can Be Found |
|---|---|
| Data Systems Technician | 138 |
| Operations Specialist | 263 |
| Ocean Systems Technician | 260 |
| Sonar Technician | 308 |
| Electronic Warfare Technician | 155 |
| Electronics Technician | 160 |
| Fire Control Technician | 177 |

Electronics Technicians, like other Warrant Officers, must have certain general qualifications, including the ability to complete ship supervision and training duties efficiently. They must also know the most important aspects of the Navy's mission, history, traditions, personnel policies, legal procedures, leadership and management techniques, communication methods, and emergency as well as routine first aid procedures.

WO Electronics Technicians must also be able to demonstrate all of the scientific, technical and managerial capabilities needed to supervise the installation, alternation, modification, maintenance and repair of electronic equipment. They must not only be able to do this work under normal conditions, but they must be prepared to do the same work during combat when a ship's equipment may be damaged. They need to be able to run repair shops and to complete the administrative details required by their job.

Because their work sometimes requires that they function as troubleshooters, WO Electronics Technicians must know the characteristics of all the electronic equipment on their ships. Much of this equipment is very sophisticated and demands that the technicians understand the electronic theory and technological design factors that make the equipment work, and the mathematical techniques for solving problems.

## EMPLOYMENT OPPORTUNITY

Approximately 300 Navy Warrant Officers are employed as Electronics Technicians on surface ships, submarines and at shore facilities. The number of opportunities for enlisted men and women to advance to this category fluctuates depending on the needs of the Navy. Entry into the WO Electronics Technician category is highly competitive, and so it is limited to outstanding men and women with extensive experience.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

The Sailor's Rank and Occupation Page 4
The General Work of the Navy Page 23
Shipboard Routine in the Navy Page 27
Shipboard Life Page 28
Lengths of Cruises and Time Between Cruises Page 30
"Shore Duty"—Work at Navy Shore Facilities Page 32
Rotation Between "Sea Duty" and "Shore Duty" Page 33
How the Navy Hires Page 35
Navy Pay Page 40
Navy Retirement Benefits Page 43
Navy Training and Education Page 44
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# WARRANT OFFICER ENGINEERING TECHNICIAN *

## NATURE OF THE JOB

Warrant Officer (WO) Engineering Technicians are specialists in the occupations of machinist and electrician. They specialize in one of these fields, based primarily on the training and experience they acquired as enlisted sailors.

The WO Engineering Technicians who work as machinists concentrate on the detailed, precise work required to keep ships' machinery working properly; and they are technical specialists in maintenance of optical equipment, instruments and office machinery. They may work as assistants to engineering and ship repair officers, or as optical and instrument repair officers. They supervise personnel engaged in the operation and maintenance of ships' propulsion and back-up machinery, engineering and repair equipment, and refrigeraion systems. They also oversee the handling, stowing and regulating of fuel oil and boiler water, and the repair, adjustment and calibration of instruments.

WO Engineering Technicians who function as electricians are specialists in electrical power, lighting and communications systems. They serve as assistants to electrical officers, and as electrical repair officers. They supervise sailors who install, adjust, test, maintain and modify shipboard electrical systems. Electrical systems are very important on ships because they assure proper power distribution, propulsion, lighting, interior

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* Each Warrant Officer Engineering Technician is involved in some of the general work of the Navy as well as the work of his or her own specialty or occupation. It is very important for each officer to understand the general work of the Navy as well as the work of his or her own specialty. The first chapter of this manual describes the general work of the Navy.

communications, steering and other vital functions. The technicians who concentrate on electricians' duties analyze, solve and correct operational problems and equipment breakdowns.

## WORKING CONDITIONS

WO Engineering Technicians must work anywhere on a ship where their expertise is required. Some of those locations are cramped, hot and noisy; others are dimly lit; others are as comfortable as a regular office. Sometimes, WO Engineering Technicians work in office spaces, aboard ships or ashore, where they perform work scheduling and other administrative duties.

### Sea-Shore Rotation

Like other Warrant Officers, Engineering Technicians spend about 3 years on "sea duty" when they become Warrants. After that, they spend 2-3 years on "shore duty," then perhaps 3 years at an overseas Navy facility or 2-3 years at sea, followed again by 2-3 years ashore, and so on until retirement.

"Sea duty" includes all of the time during which an officer is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home. "Shore duty" is duty at permanent shore locations, where WO Engineering Technicians provide support for fleet units or for the Navy in general.

Since Navy women do not serve aboard combatant ships, women in this specialty rotate among shore facilities in the United States and overseas.

## QUALIFICATIONS

WO Engineering Technicians must have served successfully as enlisted sailors and must compete to become Warrant Officers. Many kinds of rated sailors can become WO Engineering Technicians, but the persons who normally become Warrant Officers in this category are sailors in the ratings listed below.

| Enlisted Ratings | Pages in This Manual Where Information Can Be Found |
|---|---|
| Opticalman | 266 |
| Instrumentman | 200 |
| Machinery Repairman | 225 |
| Boiler Maker | 113 |
| Boiler Technician | 116 |

| Enlisted Ratings | Pages in This Manual Where Information Can Be Found |
|---|---|
| Interior Communications Electrician | 205 |
| Engineman | 168 |
| Machinist's Mate | 229 |
| Electrician's Mate | 150 |

Engineering Technicians, like other Warrant Officers, must have certain general qualifications, including the ability to complete ship supervision and training duties efficiently. They must also know the most important aspects of the Navy's mission, history, traditions, personnel policies, legal procedures, leadership and management techniques, communication methods, and emergency as well as routine first aid procedures.

In addition, WO Engineering Technicians in the machinist field must know thoroughly all the technical aspects of ships' boilers, engines, distilling plants, refrigeration systems, and air compressors. They must be able to prepare and carry out plans for keeping all of these machines running under all conditions at sea, especially after a ship has been damaged. They must be able to diagnose all kinds of machinery problems, plan for their correction, estimate the time and cost of repairs, supervise the corrective actions, and perform all the administrative actions needed to support maintenance activities. They must understand all the theoretical aspects of ships' machinery and the Navy organization that supports maintenance.

WO Engineering Technicians in the electrician's field must be able to understand all the technical aspects of ships' electrical equipment. They must be capable of all planning and supervision required by an electrical repair unit or shop. They must troubleshoot problems in electrical systems and prepare a schedule for repair actions including costs and time estimates. They have to be experts in maintenance administration procedures and know the scientific theories that explain the operation of electrical equipment.

## EMPLOYMENT OPPORTUNITY

About 650 Navy Warrant Officers are employed as Engineering Technicians on surface ships, submarines and at shore facilities. The number of opportunities changes over time depending on the needs of the Navy. Entry into the WO Engineering Technician category is highly competitive, and so it is limited to outstanding men and women with extensive experience in the Navy.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

The Sailor's Rank and Occupation Page 4
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"Shore Duty"—Work at Navy Shore Facilities Page 32
Rotation Between "Sea Duty" and "Shore Duty" Page 33
How the Navy Hires Page 35
Navy Pay Page 40
Navy Retirement Benefits Page 43
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## WARRANT OFFICER EXPLOSIVE ORDNANCE DISPOSAL TECHNICIAN *

### NATURE OF THE JOB

Warrant Officer (WO) Explosive Ordnance Disposal Technicians are technical specialists in the work that is required to safely move or dispose of explosives. They plan and supervise the activities of teams of sailors who do away with explosives and who maintain the tools, equipment and materials needed in their work. An important skill of explosive disposal is the ability to detect and identify the various types of explosive devices. At times the WO Explosive Ordnance Disposal Technician must supervise the work of sailors involved in diving or other underwater operations designed to recover explosives. Besides working as supervisors of explosives disposal teams, WO Explosive Ordnance Disposal Technicians may work as instructors in their field.

### WORKING CONDITIONS

Warrant Officers in the explosive ordnance disposal category have to work in any situation, primarily outdoors, where the services of an explosives disposal team are required. Their work with explosives is hazardous, and they must pay close attention to safety regulations and be alert for unexpected dangers. At times, they work in classrooms and offices where they teach and complete their administrative duties.

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[*] Each Warrant Officer Explosive Ordnance Disposal Technician is involved in some of the general work of the Navy as well as the work of his or her own specialty or occupation. It is very important for each officer to understand the general work of the Navy as well as the work of his or her own category. The first chapter of this manual describes the general work of the Navy.

## Sea-Shore Rotation

Like other Warrant Officers, Explosive Ordnance Disposal Technicians spend about 3 years on "sea duty" when they become Warrants. After that, they spend 2-3 years on "shore duty," then perhaps 3 years at an overseas Navy facility or 2-3 years at sea, followed again by 2-3 years ashore, and so on until retirement.

"Sea duty" includes all of the time during which an officer is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home. "Shore duty" is duty at permanent shore locations, where WO Explosive Ordnance Disposal Technicians provide support for fleet units or for the Navy in general.

Since Navy women do not serve aboard combatant ships, women in this specialty rotate among shore facilities in the United States and overseas.

## QUALIFICATIONS

WO Explosive Ordnance Disposal Technicians must have served successfully as enlisted sailors and must compete to become Warrant Officers. Sailors with various ratings or occupations may become WO Explosive Ordnance Disposal Technicians if, while enlisted, they formally qualify as Explosive Ordnance Disposal Specialists.

Explosive Ordnance Disposal Technicians, like other Warrant Officers must have certain general qualifications, including the ability to complete ship supervision and training duties efficiently. They must also know the most important aspects of the Navy's mission, history, traditions, personnel policies, legal procedures, leadership and management techniques, communication methods, and emergency as well as routine first aid procedures.

WO Explosive Ordnance Disposal Technicians must also be able to enforce strict safety precautions during all explosive ordnance moving and disposal operations. In order to supervise these operations effectively, they must be able to evaluate all the hazards that may arise and select the proper methods for overcoming the hazards. They must know how to perform searches for explosives on the surface and underwater, and to recover or destroy any explosives that are discovered. They also are responsible for installing, maintaining, inspecting and repairing all the tools and equipment used in their work. All of the work involved in explosive ordnance disposal must also be supported by administrative work such as record keeping and report writing.

- Warrant Officers in the explosive ordnance disposal category also play an important part in training. They must train other sailors in explosives disposal, overall explosives safety and emergency safety actions regarding explosives. These officers are also responsible for advising ships' captains of any unsafe or improper handling of explosives and for recommending corrective action.

EMPLOYMENT OPPORTUNITY

Approximately 40 Navy Warrant Officers are employed as Explosive Ordnance Disposal Technicians on surface ships and at shore facilities. The number of opportunities for enlisted men and women to advance to this category fluctuates depending on the needs of the Navy. Entry into this category is competitive and is limited to outstanding men and women with extensive experience.

ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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|---|---|
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# WARRANT OFFICER FOOD SERVICE*

## NATURE OF THE JOB

Food Service Warrant Officers are personnel in the Navy's Supply Corps who specialize in food service operations. They do such things as order foods and make sure that they are stored properly. Food Service Warrants also plan menus and prepare foods. They manage cafeterias and dining halls. They supervise and train other personnel in food service work.

## WORKING CONDITIONS

Food Service Warrants may work on ships or at Navy shore facilities around the world. Some have primarily administrative duties, so they do most of their work in office settings. Some do most of their work in kitchen areas or in dining halls.

### Sea-Shore Rotation

Food Service Warrant Officers spend about 3 years on "sea duty" when they become Warrants. After that, they spend 2-3 years on "shore duty," then perhaps 3 years at an overseas Navy facility or 2-3 years at sea, followed again by 2-3 years ashore, and so on until retirement.

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[*] Each Food Service Warrant Officer is involved in some of the general work of the Navy as well as the work of his or her own specialty or occupation. It is very important for each officer to understand the general work of the Navy as well as the work of his or her own specialty. The first chapter of this manual describes the general work of the Navy.

"Sea duty" includes all of the time during which an officer is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home. "Shore duty" is duty at permanent shore locations, where Food Service Warrant Officers provide support for fleet units or for the Navy in general.

Since Navy women do not serve aboard combatant ships, women in this specialty rotate among shore facilities in the United States and overseas.

## QUALIFICATIONS

Food Service Warrant Officers must have served successfully as enlisted sailors and must compete to become Warrant Officers. Although sailors in many different job categories or "ratings," can become Food Service Warrants, the sailors who do so usually have served as enlisted Mess Management Specialists. ("Mess" is the Navy term for an eating place.) A description of the Mess Management rating can be found on pp. 235-237 of this book.

Food Service Warrant Officers must have certain general qualifications, including the ability to complete ship supervision and training duties efficiently. They must also know the most important aspects of the Navy's mission, history, traditions, personnel policies, legal procedures, leadership and management techniques, communication methods, and emergency as well as routine first aid procedures.

Food Service Warrants must also be able to supervise the full range of activities required for food service in any large organization. They must know, for example, how to plan well balanced and nutritious meals. They must know the kinds of storage that different foods require as well as sanitary precautions for food storage and handling. They must know how to prepare all kinds of foods, including soups, meats, poultry and fish, vegetables and fruits, breads, pastry and other desserts. They must know how to cut meats. They must know how to operate the equipment used in preparing and serving food to large numbers of people, as well as clean-up equipment. They must know how to estimate food costs, compare prices and buy economically, and how to maintain accurate cost accounts.

## EMPLOYMENT OPPORTUNITY

Approximately 50 Navy Warrant Officers are working in the food service specialty. The position of Food Service Warrant is fairly new. The number of opportunities for enlisted men and women to advance to that position fluctuates, depending on the needs of the Navy. For example, the number of possible openings depends on the number of personnel in the Navy and on the number of separate facilities the Navy operates. There should be good future opportunities for men and women to advance, if they gain the necessary skills and knowledge while working as enlisted sailors.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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## WARRANT OFFICER INTELLIGENCE TECHNICIAN *

### NATURE OF THE JOB

Warrant Officer (WO) Intelligence Technicians are specialists in the field of photographic intelligence. They supervise and direct personnel in the preparation of photographs that are used in analyzing tactical and strategic situations, locations of foreign navies and other armed forces and their capabilities for fighting. They supervise the maintenance and use of intelligence files and the preparation of photographic material from aerial and surface photographs and from radarscopes. They serve as intelligence officers and assistant intelligence officers and as expert advisors on the identification, extraction and use of intelligence data.

### WORKING CONDITIONS

WO Intelligence Technicians may be assigned to fleet staff offices, to large ships, to aircraft squadrons or naval air stations. Their work requires close attention to detail. Normally, their work is done indoors.

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* Each Warrant Officer Intelligence Technician is involved in some of the general work of the Navy as well as the work of his or her own specialty or occupation. It is very important for each officer to understand the general work of the Navy as well as the work of his or her own specialty. The first chapter of this manual describes the general work of the Navy.

Sea-Shore Rotation

Like other Warrant Officers, Intelligence Technicians spend about 3 years on "sea duty" when they become Warrants. After that, they spend 2-3 years on "shore duty," then perhaps 3 years at an overseas Navy facility or 2-3 years at sea, followed again by 2-3 years ashore, and so on until retirement.

"Sea duty" includes all of the time during which an officer is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home. "Shore duty" is duty at permanent shore locations, where WO Intelligence Technicians provide support for fleet units or for the Navy in general.

Since Navy women do not serve aboard combatant ships, women in this specialty rotate among shore facilities in the United States and overseas.

## QUALIFICATIONS

WO Intelligence Technicians must have served successfully as enlisted sailors and must compete to become Warrant Officers. Although sailors with other ratings may become WO Intelligence Technicians, the sailors who enter this category normally have served in the rating of Photographic Intelligenceman. Information on that rating can be found on page 287 of this book.

Intelligence Technicians, like other Warrant Officers, must have certain general qualifications, including the ability to complete ship supervision and training duties efficiently. They must also know the most important aspects of the Navy's mission, history, traditions, personnel policies, legal procedures, leadership and management techniques, communication methods, and emergency as well as routine first aid procedures.

WO Intelligence Technicians must also be able to organize and supervise the operation of a photographic intelligence office. That task requires that WO Intelligence Technicians develop contacts with intelligence officers on ships and at shore facilities. Those officers are the users of the photographic information and reports that the WO Intelligence Technician analyzes.

In addition, WO Intelligence Technicians are responsible for planning the collection of intelligence through flights by aircraft. In a combat situation, the same duties are carried out to plan attack missions. WO Intelligence Technicians also have to plan and supervise the preparation of many intelligence reports and files, and the printing of maps made from pictures of the earth's surface. A special kind of map and plan is prepared by intelligence technicians for Navy pilots who need to survive and avoid enemy forces if they have to parachute into hostile territory.

WO Intelligence Technicians must also be able to analyze unsatisfactory intelligence work to determine if faulty equipment is causing the poor quality of the intelligence materials. They must then take action to correct the situation. They also have to supervise the day-to-day maintenance of the photographic and other equipment used in their work, and they must keep complete and secure files of intelligence information.

## EMPLOYMENT OPPORTUNITY

Approximately 20 Navy Warrant Officers are employed as Intelligence Technicians. The number of opportunities for enlisted men and women to enter the intelligence technician category fluctuates depending on the needs of the Navy. Entry is highly competitive and is limited to outstanding men and women with extensive experience in the Navy.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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# WARRANT OFFICER NUCLEAR POWER TECHNICIAN *

## NATURE OF THE JOB

The Bureau of Naval Personnel has not yet published an official description of the new category of Warrant Officers (WOs) called "Nuclear Power Technicians." Based on the information that is available, it can be said that WO Nuclear Power Technicians are specialists who assure that nuclear powered submarines and ships operate effectively and safely. Their work is very similar to that described under "Engineering Technician" in this book, but their focus on the nuclear field adds a very important dimension to their activities.

Available information also indicates that WO Nuclear Power Technicians must have performed successfully as enlisted personnel in the nuclear field. This means that while they were rated sailors, they attended an intense, extended Navy nuclear power school and proved their knowledge by working on nuclear powered submarines or ships. While performing that work, the Nuclear Power Technicians probably served in one of the following ratings.

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* Each Warrant Officer Nuclear Power Technician is involved in some of the general work of the Navy as well as the work of his own specialty or occupation. It is very important for each officer to understand the general work of the Navy as well as the work of his own specialty. The first chapter of this manual describes the general work of the Navy.

| Enlisted Ratings | Pages in This Manual Where Information Can Be Found |
|---|---|
| Machinist's Mate | 229 |
| Electrician's Mate | 150 |
| Electronics Technician | 160 |
| Interior Communications Technician | 205 |

So it can be said that the 150 WO Nuclear Power Technicians working on submarines, surface ships and at shore facilities must proceed through three steps, each of which is competitive and rigorous. First, they must be selected to go to nuclear power school; second, they must complete the school satisfactorily; third, they must demonstrate their skills and technical knowledge so conclusively that they can qualify for the Warrant Officer category.

Other than those preliminary statements concerning the WO Nuclear Power Technician, little need be added to the description of "Engineering Technician" on pages 500-503 of the manual.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

| | |
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# WARRANT OFFICER OPERATIONS TECHNICIAN *

## NATURE OF THE JOB

Warrant Officer (WO) Operations Technicians are electronics specialists who focus their skills on the communications, antisubmarine warfare and combat information center functions of ships. Their work requires that they be experts in the procedures, techniques and equipment that are necessary for those important functions. Sometimes, WO Operations Technicians work as assistants to other officers who are in charge of communications, antisubmarine tactics and coordination of the flow of combat information to all the key members of a ship's team. At other times, WO Operations Technicians supervise electronics technicians and other sailors who use and maintain all the electronic instruments used in these operations. Finally, WO Operations Technicians act as troubleshooters who analyze, solve and correct problems with operational procedures or equipment.

## WORKING CONDITIONS

WO Operations Technicians often work in enclosed areas that are dimly lit except for the lighted boards that show the positions of ships and other kinds of information.

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* Each Warrant Officer Operations Technician is involved in some of the general work of the Navy as well as the work of his or her own specialty or occupation. It is very important for each officer to understand the general work of the Navy as well as the work of his or her own specialty. The first chapter of this manual describes the general work of the Navy.

## Sea-Shore Rotation

Like other Warrant Officers, Operations Technicians spend about 3 years on "sea duty" when they become Warrants. After that, they spend 2-3 years on "shore duty," then perhaps 3 years at an overseas Navy facility or 2-3 years at sea, followed again by 2-3 years ashore, and so on until retirement.

"Sea duty" includes all of the time during which an officer is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home. "Shore duty" is duty at permanent shore locations, where WO Operations Technicians provide support for fleet units or for the Navy in general.

Since Navy women do not serve aboard combatant ships, women in this specialty rotate among shore facilities in the United States and overseas.

## QUALIFICATIONS

WO Operations Technicians must have served successfully as enlisted sailors and must compete to become Warrant Officers. Many kinds of rated sailors can become WO Operations Technicians. The personnel who normally become Warrant Officers in this category are sailors in the ratings listed below.

| Enlisted Ratings | Pages in This Manual Where Information Can Be Found |
|---|---|
| Electrician's Mate | 150 |
| Ocean Systems Technician | 260 |
| Operations Specialist | 263 |
| Quartermaster | 291 |
| Radioman | 295 |
| Signalman | 303 |
| Sonar Technician | 308 |

Operations Technicians, like other Warrant Officers, must have certain general qualifications, including the ability to complete ship supervision and training duties efficiently. They must also know the most important aspects of the Navy's mission, history, traditions, personnel policies, legal procedures, leadership and management techniques, communication methods, and emergency as well as routine first aid procedures.

In addition, WO Operations Technicians must be prepared to perform all the planning, supervising and operating duties that their technical specialty demands. That means that they must know thoroughly the steps involved in their ships' operations, the electronic equipment that is used in operations and the capabilities of all the sailors on their operations teams. They must know the scientific principles of radio and sound waves and all Navy and international procedures for communications. Finally, they must be able to carry out all the work necessary to have maintenance performed on electronic equipment.

## EMPLOYMENT OPPORTUNITY

Approximately 100 Navy Warrant Officers serve as Operations Technicians in the surface ship field and about 145 work in the submarine field. Opportunities vary over time depending on the needs of the Navy. Entry into the WO Operations Technician category is highly competitive, and so it is limited to outstanding men and women with extensive experience in the Navy.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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## WARRANT OFFICER ORDNANCE TECHNICIAN *

### NATURE OF THE JOB

Warrant Officer (WO) Ordnance Technicians are technical specialists in the operation and maintenance of naval guns, rockets and rocket launchers, missiles and missile launchers, small arms, and in the advanced technology used for weapons guidance and control. Within this Warrant Officer category are two titles, Surface Ordnance Technician and Ordnance Control Technician.

WO Surface Ordnance Technicians may serve as assistant weapons officers and as ordnance repair officers. They supervise other sailors who assemble, install, operate, test, maintain and repair weapons, the equipment that backs up the weapons and the ammunition that the weapons fire.

WO Ordnance Control Technicians specialize in the supervision of work on the gyroscopic equipment, radars, computers, rangekeepers, rocket launchers, torpedo control systems and other equipment that enables sailors to hit their targets. WO Ordnance Control Technicians may, like their WO Surface Ordnance counterparts, serve as assistant weapons officers, and as ordnance repair officers.

### WORKING CONDITIONS

WO Ordnance Technicians share the working conditions of the sailors they supervise. This requires that they work outdoors in weather good or bad.

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* Each Warrant Officer Ordnance Technician is involved in some of the general work of the Navy as well as the work of his own specialty or occupation. It is very important for each officer to understand the general work of the Navy as well as the work of his own specialty. The first chapter of this manual describes the general work of the Navy.

Sometimes, their work may be hazardous, and they must maintain constant attention to teamwork and safety. WO Ordnance Technicians may sometimes work in office spaces to complete their planning and administrative tasks.

Sea-Shore Rotation

Like other Warrant Officers, Ordnance Technicians spend about 3 years on "sea duty" when they become Warrants. After that, they spend 2-3 years on "shore duty," then perhaps 3 years at an overseas Navy facility or 2-3 years at sea, followed again by 2-3 years ashore, and so on until retirement.

"Sea duty" includes all of the time during which an officer is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home. "Shore duty" is duty at permanent shore locations, where WO Ordnance Technicians provide support for fleet units or for the Navy in general.

## QUALIFICATIONS

WO Ordnance Technicians must have served successfully as enlisted sailors and must compete to become Warrant Officers. Many kinds of rated sailors may become WO Ordnance Technicians, but the sailors who enter this Warrant Officer category normally come from the following ratings.

| Enlisted Ratings | Pages in This Manual Where Information Can Be Found |
|---|---|
| Gunner's Mate | 182 |
| Fire Control Technician | 177 |
| Missile Technician | 242 |

Ordnance Technicians, like other Warrant Officers must have certain general qualifications, including the ability to complete ship supervision and training duties efficiently. They must also know the most important aspects of the Navy's mission, history, traditions, personnel policies, legal procedures, leadership and management techniques, communication methods, and emergency as well as routine first aid procedures.

WO Surface Ordnance Technicians must be able to plan for and supervise many activities that assure the proper working order of guns, gun mounts, missiles and launchers. Those types of equipment require electrical, hydraulic and mechanical tests, maintenance, repair and modification. Technicians must also be experts in preparing those systems for firing, and they must be able to take over control of those weapons for firing at air or surface targets. They must, at times, select, instruct, and practice with the crews that operate guns, gun turrets and missile launchers. WO Surface Ordnance Technicians must also plan and supervise training in small arms (rifles, pistols, machine guns) and hand grenades. They must also be able to organize and run the shops that repair weapons. All of their work requires the ability to carry out administrative procedures, including keeping maintenance histories on all equipment.

In order to complete their work properly, WO Surface Ordnance Technicians must understand thoroughly all of the chemical and physical characteristics of Navy weapons and ammunition, all of the orderly procedures for their use and maintenance and all of the Navy organizations and documents that are involved with ordnance work.

WO Ordnance Control Technicians must be able to plan for and supervise the work that is required to ensure that Navy weapons fire accurately. The systems that control such weapons operate on electrical, electronic, mechanical and hydraulic principles. They must be constantly tested, balanced, adjusted, aligned, and sometimes modified. Similarly, the crews that guide the aiming of Navy guns must be well chosen, trained and drilled in their work. WO Ordnance Control Technicians must coordinate the control machinery with the sailors performing fire control duties. They must also organize and run the shops where the control mechanisms are repared. They must complete all the administrative work required by major repairs and keep maintenance histories on all equipment.

WO Ordnance Control Technicians must know the characteristics of all their equipment, the scientific principles underlying their operation and all the ways that their fire control and maintenance work affects the work of their ship and the Navy.

## EMPLOYMENT OPPORTUNITY

Approximately 200 Navy Warrant Officers are working as WO Ordnance Technicians on surface ships and submarines and at shore facilities. The number of opportunities for enlisted personnel to advance to the Warrant Officer category fluctuates depending on the needs of the Navy. Entry into this category is highly competitive, and so it is limited to outstanding sailors with extensive experience in the Navy.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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## WARRANT OFFICER PHOTOGRAPHER *

### NATURE OF THE JOB

Warrant Officer (WO) Photographers are specialists in the field of military photography. They are responsible for keeping cameras and other sensors used in reconnaissance in proper working condition. ("Reconnaissance" means gathering information about places that are too far away to be seen from a ship or naval base. Usually this is done by taking pictures from airplanes.) WO Photographers supervise other sailors who operate, test and maintain photographic equipment and photographic laboratories. WO Photographers serve in supervisory jobs on ships and at shore facilities, and they work as expert advisors to other officers who need to know the uses, capabilities and limitations of photographic equipment. Much of the naval photographic equipment produces typical motion pictures and still photographs. Some of the Navy's cameras, however, produce images that are made from the patterns of heat given off from an area of the ground or the ocean.

### WORKING CONDITIONS

WO Photographers are assigned to aircraft carriers, to naval bases and naval air stations. They may work outdoors in all kinds of weather, in laboratories, and in office spaces where they do their planning and administrative work.

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* Each Warrant Officer Photographer is involved in some of the general work of the Navy as well as the work of his or her own specialty or occupation. It is very important for each officer to understand the general work of the Navy as well as the work of his or her own specialty. The first chapter of this manual describes the general work of the Navy.

## Sea-Shore Rotation

Like other Warrant Officers, Photographers spend about 3 years on "sea duty" when they become Warrants. After that, they spend 2-3 years on "shore duty," then perhaps 3 years at an overseas Navy facility or 2-3 years at sea, followed again by 2-3 years ashore, and so on until retirement.

"Sea duty" includes all of the time during which an officer is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home. "Shore duty" is duty at permanent shore locations, where WO Photographers provide support for fleet units or for the Navy in general.

Since Navy women do not serve aboard combatant ships, women in this specialty rotate among shore facilities in the United States and overseas.

## QUALIFICATIONS

WO Photographers must have served successfully as enlisted sailors and must compete to become Warrant Officers. Although sailors with other specialties may become WO Photographers, the personnel who become Warrant Officers in this category normally have one of the following ratings.

| Enlisted Ratings | Pages in This Manual Where Information Can Be Found |
|---|---|
| Illustrator-Draftsman | 196 |
| Journalist | 210 |
| Photographer's Mate | 283 |

Photographers, like other Warrant Officers must have certain general qualifications, including the ability to complete ship supervision and training duties efficiently. They must also know the most important aspects of the Navy's mission, history, traditions, personnel policies, legal procedures, leadership and management techniques, communication methods, and emergency as well as routine first aid procedures.

WO Photographers must be able to organize, supervise and direct the operation of a Photographic laboratory. They are responsible for coordinating their work with intelligence and public information offices as well as for maintaining the quality of the photographic images they produce. They must conduct inspections of their equipment and of the work of the sailors they supervise. Photographers must control their photographic supplies and provide for resupply. Their photographic operations require that they keep records on their equipment and perform other administrative tasks. WO Photographers also must train pilots and aircrews in photographic flight techniques, and in capabilities and limitations of various kinds of cameras and related equipment.

WO Photographers must also know the principles and techniques of photographic processing, lighting, photographic measurement and photographic laboratory administration.

## EMPLOYMENT OPPORTUNITY

Approximately 35 Navy Warrant Officers are employed as Photographers primarily on aircraft carriers and at naval shore facilities. The number of opportunities for enlisted men and women to advance to this Warrant Officer category fluctuates depending on the needs of the Navy. Entry into this category is competitive and is limited to outstanding men and women with extensive experience.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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## WARRANT OFFICER PHYSICIAN'S ASSISTANT*

### NATURE OF THE JOB

Warrant Officer (WO) Physician's Assistants are skilled health professionals. They work under the supervision of Navy physicians. They perform medical care tasks delegated to them by their supervisors.

The role of WO Physician's Assistants is to ease the workload of licensed physicians, so that the quality of Navy medical services can be improved and so that services will be more readily available. WO Physician's Assistants perform tasks that formerly were done only by licensed physicians. For example, WO Physician's Assistants interview patients to obtain medical histories. They perform certain physical examinations and, as necessary, order further diagnostic procedures (such as X-rays, blood analyses, electrocardiograms, etc.). They record and evaluate the results of examinations and other diagnostics, and they may prescribe some kinds of treatments for some medical problems.

### WORKING CONDITIONS

WO Physician's Assistants work in Navy hospitals and clinic facilities in the United States or abroad. They may also work aboard large ships such as aircraft carriers. The physical working conditions depend on the locations to which WO Physician's Assistants are assigned. They may work in very large, modern hospitals in major cities in this and other countries. They may also work in small clinics on remote islands. Like civilian medical personnel, Navy WO Physician's Assistants may work night or day shifts.

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* Each Warrant Officer Physician's Assistant is involved in some of the general work of the Navy as well as the work of his or her own specialty or occupation. It is very important for each officer to understand the general work of the Navy as well as the work of his or her own specialty. The first chapter of this manual describes the general work of the Navy.

### Sea-Shore Rotation

The usual tour of duty for WO Physician's Assistants is about 3 years. That means WO Physician's Assistants can expect to be assigned to new locations about every 3 years. Assignment rotations for most Navy personnel follow a pattern of about 3 years of sea duty, followed by 2-3 years of shore duty and then 2-3 years at a shore station overseas or on sea duty again. Assignment rotations for WO Physician's Assistants usually do not follow such a consistent pattern. However, during their careers, WO Physician's Assistants can expect to serve at a variety of shore locations in the United States and abroad and probably to serve at sea as well.

Since Navy women do not serve aboard combatant ships, women in this specialty rotate among shore facilities in the United States and overseas.

## QUALIFICATIONS

WO Physician's Assistants must have completed at least 3 years of continuous active naval service as enlisted sailors. They must have served successfully in the job category, or "rating," of Hospital Corpsman during their enlistment and they must be petty officers second class or above when they apply for the Physician's Assistant Program. (See pp. 187-190 of this book for a description of the Hospital Corpsman rating.) Applicants must be younger than 34 years of age as of July 1 of the year in which they apply.

The position of WO Physician's Assistant is competitive. Applicants who meet the basic qualifications are evaluated by a selection board. The board chooses applicants for training on a competitive basis. Those chosen must complete 12 months of school training successfully. Then they receive apprentice or intern-type training at a naval hospital. Applicants are eligible to be appointed as WO Physician's Assistants only after successfully completing both the school training and the clinical apprenticeship.

## EMPLOYMENT OPPORTUNITY

The position of WO Physician's Assistant is new. Currently, there are about 50 Navy Warrant Officers working as Physician's Assistants. The number of opportunities for enlisted men and women to advance to that position will vary, depending on the needs of the Navy. It appears that there will be continuing opportunities. However, the qualifications are high and competition is keen.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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## WARRANT OFFICER REPAIR TECHNICIAN *

### NATURE OF THE JOB

Warrant Officer (WO) Repair Technicians are specialists in maintenance, damage control, and firefighting procedures, techniques and equipment. They concentrate on the care of ships' structures, so they supervise sailors who are involved in electric arc-welding, oxyacetylene welding and cutting, woodworking, metalworking, boat repairs, foundry operations, patternmaking, piping and drainage, and in providing facilities for protection from nuclear, biological and chemical warfare. Repair Technicians are assistants to engineering and repair officers and supervise repair shops.

### WORKING CONDITIONS

WO Repair Technicians must work, at times, in cramped areas, that may be noisy and hot, sometimes because of the welding, cutting and foundry tasks of their own work. At other times, Repair Technicians work in office spaces where they complete their planning and administrative tasks.

#### Sea-Shore Rotation

Like other Warrant Officers, Repair Technicians spend about 3 years on "sea duty" when they become Warrants. After that, they spend 2-3 years

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* Each Warrant Officer Repair Technician is involved in some of the general work of the Navy as well as in the work of his or her own specialty or occupation. It is very important for each officer to understand the general work of the Navy as well as the work of his or her own specialty. The first chapter of this manual describes the general work of the Navy.

on "shore duty," then perhaps 3 years at an overseas Navy facility or 2-3 years at sea, followed again by 2-3 years ashore, and so on until retirement.

"Sea duty" includes all of the time during which an officer is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home. "Shore duty" is duty at permanent shore locations, where WO Repair Technicians provide support for fleet units or for the Navy in general.

Since Navy women do not serve aboard combatant ships, women in this specialty rotate among shore facilities in the United States and overseas.

## QUALIFICATIONS

WO Repair Technicians must have served successfully as enlisted sailors and must compete to become Warrant Officers. Although many kinds of rated sailors can become WO Repair Technicians, the personnel who normally become Warrant Officers in this category are sailors in the ratings listed below.

| Enlisted Ratings | Pages in This Manual Where Information Can Be Found |
|---|---|
| Molder | 247 |
| Patternmaker | 270 |
| Hull Maintenance Technician | 191 |

Repair Technicians, like other Warrant Officers must have certain general qualifications, including the ability to complete ship supervision and training duties efficiently. They must also know the most important aspects of the Navy's mission, history, traditions, personnel policies, legal procedures, leadership and management techniques, communication methods, and emergency as well as routine first aid procedures.

WO Repair Technicians must also be able to plan for and supervise many activities that assure the safety and strength of ships' structures under many kinds of conditions. Among these activities are:

- Testing and evaluation of ship repair, firefighting and damage control equipment
- Taking fresh and salt water onto ships
- Testing, maintenance and repair of masks, respirators, diving equipment, sprinkler systems and fire extinguishing chemicals and equipment

- Repairs of parts of ships' hulls, pipes and equipment
- Instruction of firefighting teams and special teams for protection against nuclear, biological and chemical warfare
- Operation of many kinds of metalworking activities.

WO Repair Technicians must also know how to perform all the maintenance administration tasks in their field. They must also know the capabilities of all the instruments, tools and equipment they can use to do their work in the most efficient manner.

## EMPLOYMENT OPPORTUNITY

Approximately 135 Navy Warrant Officers are working as Repair Technicians on surface ships, submarines and at shore facilities. The number of opportunities fluctuates depending on the needs of the Navy. Entry into this category is highly competitive, and so it is limited to outstanding men and women with extensive experience in the Navy.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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## WARRANT OFFICER SHIP'S CLERK *

### NATURE OF THE JOB

Warrant Officer (WO) Ship's Clerks are specialists in naval administration, personnel administration and office organization. Their duties vary, depending on the specific jobs to which they are assigned. They may serve as secretaries or as personnel, education, or classification officers. They may supervise the operation of Navy post offices, public information programs, and shipboard printshops.

WO Ship's Clerks supervise personnel in duties such as preparation and processing of correspondence, maintenance of personnel records, accounting, report preparation, and printing and distribution of Navy publications.

### WORKING CONDITIONS

WO Ship's Clerks share the working conditions of the personnel they supervise. They may work aboard ships or at shore stations. Most of their work is done in an office setting. Some WO Ship's Clerks work in printshops, as indicated above.

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* Each Warrant Officer Ship's Clerk is involved in some of the general work of the Navy as well as the work of his or her own specialty or occupation. It is very important for each officer to understand the general work of the Navy as well as the work of his or her own specialty. The first chapter of this manual describes the general work of the Navy.

## Sea-Shore Rotation

Like other Warrant Officers, Ship's Clerks spend about 3 years on "sea duty" when they become Warrants. After that, they spend 2-3 years on "shore duty," then perhaps 3 years at an overseas Navy facility or 2-3 years at sea, followed again by 2-3 years ashore, and so on until retirement.

"Sea duty" includes all of the time during which an officer is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home. "Shore duty" is duty at permanent shore locations, where WO Ship's Clerks provide support for fleet units or for the Navy in general.

Since Navy women do not serve aboard combatant ships, women in this specialty rotate among shore facilities in the United States and overseas.

## QUALIFICATIONS

WO Ship's Clerks must have served successfully as enlisted sailors and must compete to become Warrant Officers. Warrant Officers in the Ship's Clerk specialty normally are selected from among enlisted sailors in the following job categories, or "ratings."

| Enlisted Ratings | Pages in This Manual Where Information Can Be Found |
|---|---|
| Journalist | 210 |
| Legalman | 215 |
| Lithographer | 220 |
| Personnelman | 274 |
| Postal Clerk | 279 |
| Yeoman | 331 |

Ship's Clerks, like other Warrant Officers, must have certain general qualifications, including the ability to complete ship supervision and training duties efficiently. They must also know the most important aspects of the Navy's mission, history, traditions, personnel policies, legal procedures, leadership and management techniques, communication methods, and emergency as well as routine first aid procedures.

WO Ship's Clerks must also be able to demonstrate all of the knowledge and technical and managerial capabilities needed to supervise workers in their administrative specialties. WO Ship's Clerks must be thoroughly familiar with Navy regulations. They must know the objectives, principles, and procedures of the Naval Manpower Information System and the Navy records management system, including forms control and disposal procedures and standards for issuing and filing directives. They must know the purposes and procedures of the naval communication system, including types and distribution of messages, standard abbreviations and rules for drafting messages. They must be skilled in organizational analysis and work simplification methods. They must be familiar with sources of information about the Navy schools and courses and other matters of interest to Navy personnel and to the public.

## EMPLOYMENT OPPORTUNITY

Approximately 260 Navy Warrant Officers are employed as Ship's Clerks on surface ships, on submarines, and at shore facilities. The number of opportunities for enlisted men and women to advance to Warrant Officer status fluctuates, depending on the needs of the Navy. The position of WO Ship's Clerk is competitive, and there is a large number of personnel in the enlisted ratings that provide candidates for WO Ship's Clerk. Thus enlisted men and women who want to advance to WO Ship's Clerk must show a high level of competence.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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# WARRANT OFFICER SUPPLY CLERK*

## NATURE OF THE JOB

Supply Clerk Warrant Officers are specialists in all kinds of supply matters. They do accounting, administer payrolls, and keep track of supplies and equipment. They supervise other sailors who are involved in purchasing, storing and distributing supplies and monies. They may also supervise the running of ships' stores, Navy exchanges, commissary (grocery) departments and finance offices. They must prepare inventories of supplied and equipment and estimate supply and equipment needs for a ship. They must prepare audits, budget estimates and plans for storing supplies.

## WORKING CONDITIONS

Supply Clerk Warrant Officers usually work in office spaces on surface ships and submarines and at naval shore facilities.

### Sea-Shore Rotation

Supply Clerk Warrant Officers spend about 3 years on "sea duty" when they become Warrants. After that, they spend 2-3 years on "shore duty," then perhaps 3 years at an overseas Navy facility or 2-3 years at sea, followed again by 2-3 years ashore, and so on until retirement.

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* Each Supply Clerk Warrant Officer is involved in some of the general work of the Navy as well as the work of his or her own specialty or occupation. It is very important for each officer to understand the general work of the Navy as well as the work of his or her own specialty. The first chapter of this manual describes the general work of the Navy.

"Sea duty" includes all of the time during which an officer is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home. "Shore duty" is duty at permanent shore locations, where Supply Clerk Warrant Officers provide support for fleet units or for the Navy in general.

Since Navy women do not serve aboard combatant ships, women in this specialty rotate among shore facilities in the United States and overseas.

## QUALIFICATIONS

Supply Clerk Warrant Officers must have served successfully as enlisted sailors and must compete to achieve their Warrant Officer rank. Although many kinds of sailors may qualify in this category, the personnel who become Supply Clerk Warrant Officers normally come from one of the following ratings.

| Enlisted Ratings | Pages in This Manual Where Information Can Be Found |
|---|---|
| Aviation Storekeeper | 98 |
| Disbursing Clerk | 146 |
| Mess Management Specialist | 235 |
| Ship's Serviceman | 300 |
| Storekeeper | 316 |

Supply Clerk Warrant Officers must have certain general qualifications, including the ability to complete ship supervision and training duties efficiently. They must also know the most important aspects of the Navy's mission, history, traditions, personnel policies, legal procedures, leadership and management techniques, communication methods, and emergency as well as routine first aid procedures.

Supply Clerk Warrant Officers must also be able to supervise all the activities related to large supply operations. They must know all the organizations involved in Navy supply, the methods of computing pay, travel payments, and payments for dependents of sailors. They must be able to practice all accounting procedures. They must be able to make sure that a ship has the supplies it needs before it sails, including all the food and clothing appropriate for the duration and location of the cruise. They must know all the latest Navy techniques for maintaining efficiency by using labor saving devices effectively. They must know how to assure that sailors have balanced diets and how to purchase food for a balanced diet within a budget.

## EMPLOYMENT OPPORTUNITY

About 250 Navy Warrant Officers are employed as Supply Clerk specialists. The number of opportunities for enlisted men and women to advance to this category fluctuates depending on the needs of the Navy. Entry into this category is competitive and is limited to outstanding men and women who have extensive experience in the Navy.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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# WARRANT OFFICER UNDERWATER ORDNANCE TECHNICIAN *

## NATURE OF THE JOB

Warrant Officer (WO) Underwater Ordnance Technicians are specialists in the machinery and explosive weapons that are fired underwater, i.e., torpedoes, depth charges and mines. They may work as assistant weapons officers and as ordnance repair officers. WO Underwater Ordnance Technicians supervise personnel who are engaged in assembling, installing, operating, testing and maintaining the equipment that launches, propels or retrieves torpedoes, depth charges and mines.

(The word "underwater" in the title of this Warrant Officer category does not mean that all of the officers who have this title are employed on submarines. Some work on surface ships, at air stations and at other shore facilities.)

## WORKING CONDITIONS

WO Underwater Ordnance Technicians share the working conditions of the sailors they supervise. They may work in a shop-like setting, in close quarters on submarines or outdoors on surface ships where weapons are fired. Because they handle explosives, these technicians must emphasize teamwork

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* Each Warrant Officer Underwater Ordnance Technician is involved in some of the general work of the Navy as well as the work of his or her own specialty or occupation. It is very important for each officer to understand the general work of the Navy as well as the work of his or her own specialty. The first chapter of this manual describes the general work of the Navy.

and safety. Sometimes, WO Underwater Ordnance Technicians work in office spaces where they prepare their work schedules, training plans and administrative papers.

Sea-Shore Rotation

Like other Warrant Officers, Underwater Ordnance Technicians spend about 3 years on "sea duty" when they become Warrants. After that, they spend 2-3 years on "shore duty," then perhaps 3 years at an overseas Navy facility or 2-3 years at sea, followed again by 2-3 years ashore, and so on until retirement.

"Sea duty" includes all of the time during which an officer is assigned to a fleet unit (a ship, squadron or fleet staff). Much of that time will be spent in port at home bases. Therefore, the term "sea duty" does not mean time away from home but rather time during which there will be some periods away from home. "Shore duty" is duty at permanent shore locations, where WO Underwater Ordnance Technicians provide support for fleet units or for the Navy in general.

Since Navy women do not serve aboard combatant ships, women in this specialty rotate among shore facilities in the United States and overseas.

## QUALIFICATIONS

WO Underwater Ordnance Technicians must have served successfully as enlisted sailors and must compete to become Warrant Officers. Many kinds of rated sailors can become WO Underwater Ordnance Technicians, but the sailors who normally become Warrant Officers in this category come from the Torpedoman's Mate and Mineman ratings. Information on those ratings is included in this book on pages 320 and 229 respectively.

Underwater Ordnance Technicians, like other Warrant Officers, must have certain general qualifications, including the ability to complete ship supervision and training duties efficiently. They must also know the most important aspects of the Navy's mission, history, traditions, personnel policies, legal procedures, leadership and management techniques, communication methods, and emergency as well as routine first aid procedures.

WO Underwater Ordnance Technicians must be able to plan and supervise the testing, maintenance, repair and modification of underwater weapons. They must organize and run workshops; plan and conduct inspections and tests for diagnosing defects in weapons, and supervise evaluation of the effectiveness of equipment. They must also know how to plan a minefield and how to supervise minelaying and minesweeping operations performed by submarines, aircraft or surface ships. They must also know how to perform the administrative work that is required by their other activities.

WO Underwater Ordnance Technicians must also understand thoroughly the characteristics of all their equipment and weapons and their scientific concepts. They must know the characteristics of foreign as well as Navy mines. They must be able to interpret the effects of the sea and water on minelaying and minesweeping equipment. Much of their work involves electrical and electronic symbols, blueprints and schematic diagrams. Finally, they must be able to fit their work into all the standard technical procedures of the Navy, so they must have first-hand knowledge of the Navy organization, duties and work procedures.

## EMPLOYMENT OPPORTUNITY

About 50 Navy Warrant Officers are employed as Underwater Ordnance Technicians on surface ships and submarines and at shore facilities. The number of opportunities for enlisted men and women to enter the Warrant Officer category fluctuates depending on the needs of the Navy. Entry into the small number of WO Underwater Ordnance Technician positions is highly competitive, and so it is limited to outstanding men and women with extensive experience in the Navy.

## ADDITIONAL INFORMATION

Chapter I, "The Navy as an Employer," of this manual contains important general information about the Navy. Some of the major topics discussed in Chapter I are listed below.

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